

Service Manual

COMPACT
disc
DIGITAL AUDIO

DIGITAL

Compact Disc Player

SL-PJ44

Color

(K) Black Type



Area

Color	Areas
(K)	[E] Continental Europe.
(K)	[Ei] Italy.
(K)	[EG] ... F.R. Germany.
(K)	[EB] ... Belgium.
(K)	[EK] ... United Kingdom.
(K)	[EF] ... France.
(K)	[EH] ... Holland.
(K)	[XL] ... Australia.
(K)	[XA] ... Asia, Latin America, Middle Near East, Africa and Oceania.
(K)	[PA] ... Far East PX.
(K)	[PE] ... European Military.
(K)	[PC] ... European Audio Club.
(K)	[XB] ... Saudi Arabia.

SPECIFICATIONS

■ Audio

Number of channels: 2 (left and right, stereo)
 Frequency response: 2 ~ 20,000 Hz (EIAJ)
 Dynamic range: 96dB
 S/N ratio: 96dB (EIAJ)
 Harmonic distortion: 0.003% (1kHz, 0dB)
 Total harmonic distortion: 0.004% (1kHz, 0dB) (EIAJ)
 Channel separation: 90dB (EIAJ)
 Wow and flutter: Below measurable limit
 Low-pass filter: High-resolution digital filter

■ Signal Format

Sampling frequency: 44.1kHz
 Correction system: Technics Super Decoding Algorithm
 D-A conversion: 16-bit linear

■ Pickup

Access time: 1 second
 (access to the last track)
 Light source: Semiconductor laser
 Wavelength: 780nm
 Traverse system: High-speed linear access system

■ Functions

Automatic play: All tracks
 Direct access play: Track number
 Repeat play: Entire disc or programmed tracks

Search: Forward/backward track skip
 Forward/backward manual search

Program play: For up to 20 selections
 CD edit recording

Display: Total tracks (up to 99)
 Programmed track
 Current track
 Time display (min., sec.)
 Time modes display
 Time scale

Indicators: Music matrix (15)
 Overflow indicator
 Disc indicator
 Edit indicator
 Tape side A/B indicator
 Repeat indicator
 Play indicator
 Pause indicator

Disc loading: Motor-driven horizontal type

Headphone output level: 15mW max. 32Ω

Headphone Plug: 1/4 inch stereo

Synchro recording terminal: 1/8 inch

Technics

Matsushita Electric Trading Co., Ltd.
 P.O. Box 288, Central Osaka Japan

Panasonic Tokyo Office
 Matsushita Electric Trading Co., Ltd.
 6th Floor, World Trade Center Bldg.,
 No. 4-1, Hamamatsu-cho 2-Chome, Minato-ku,
 Tokyo 105, Japan

■ General

Power supply:	For United Kingdom and Australia:
	AC240V,50Hz
	For Continental Europe:
	AC220V,50Hz
	For Others:
	AC110~127V/220~240V,50/60Hz
Power consumption:	10W
Output voltage:	2V (at 0dB) (EIAJ)
Output impedance:	Approx. 600Ω
Load impedance:	More than 10kΩ

Dimensions (W×D×H):	36 X 28 X 7.7 cm
	< When disc holder is opened: 42 cm (D) >
Weight:	3.3kg

■ Infrared remote control unit

Dimensions (W×D×H):	5.2 X 16.8 X 2.8 cm
Batteries:	UM-3 "AA" batteries or IEC R6 or equivalent (1.5V X 2)
Weight:	110g (including batteries)

Specifications are subject to change without notice.
Weight and dimensions are approximate.
Measured by EIAJ (CP-307).

■ CONTENTS

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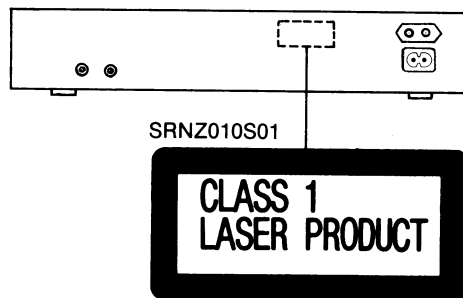
■ PRECAUTION OF LASER DIODE

Caution: This product utilizes a laser diode.
ADVARSEL: I dette a apparat anvendes laser.

• Use of caution labels

Note: ○ Mark is used, × Mark is not used.

Areas	SRNZ010S01	SRNZ010S02	SQWD48	SQWD47
[E]	○	○	○	○
[EK], [XL], [EG], [EB], [EH], [EF], [Ei], [XA], [XB]	○	○	×	○



Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass

SQWD48

ADVARSEL - Usynligt
laserlys udstråles ved
åbning. UNDGÅ DIREKTE
BESTRÅLING.

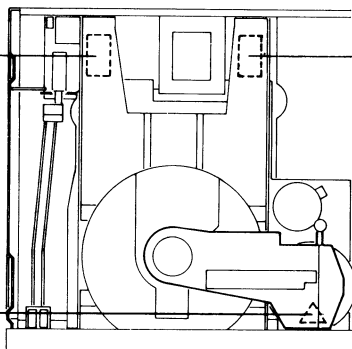
SQWD47

DANGER-Invisible laser
radiation when open.
AVOID DIRECT EX-
POSURE TO BEAM.

VAROITUS! Laite sisältää
laserdiodin, joka lähettää
näkyvätöntä silmille
vaarallista lasersäteilyä

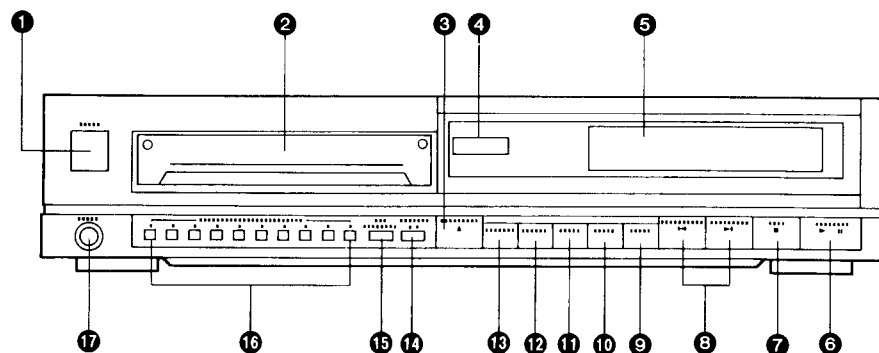


SRNZ010S02



■ LOCATION OF CONTROLS

Front Panel



① Power (mains) switch

② Disc holder

③ Open/close button

④ Remote control sensor

⑤ Display panel

(See page 4.)

⑥ Play/pause button

This button is used for the following three operations.

1. If the button is pressed while the unit is in the stop mode or in the pause mode, play begins and the play indicator illuminates.
2. If the button is pressed during play, the unit goes to the pause mode, and the pause indicator illuminates.
3. If the synchro-recording cord is properly connected, pressing this button when the unit is in the stop or pause modes causes the amplifier's input selector to switch to "CD" automatically.

⑦ Stop button

Press this button to stop disc play and cancel all previous settings.

⑧ Forward and backward skip/search buttons

These buttons are used for the following two operations.

1. To skip to the beginning of a specific track (**skip play**). Press either button momentarily (less than one second) during play or in the pause mode. The number of tracks skipped is the same as the number of times one of these buttons is pressed.
2. To move the pickup forward or backward to a desired point (**manual search play**). Keep either button pressed during play or in the pause mode and release it when the pickup reaches the desired point. The pickup moves slowly at first and then rapidly if one of the skip/search buttons is held down for more than about 3 seconds.

⑨ Repeat button

Press this button to activate the repeat mode. (The repeat indicator illuminates.) Press again to cancel the repeat mode.

⑩ Recall button

Press this button to display the program play sequence in the memory.

When this button is pressed, the tracks stored in the memory for program play are shown one by one.

⑪ Clear button

To cancel a track number from memory, first press the appropriate numeric button to display the number of the track you wish to cancel, then press this button.

⑫ Memory button

Press this button to enter track numbers before starting play (program play).

(A maximum of 20 selections can be programmed.)

- The letter "F" (FULL) will be displayed if more than 20 memory selection are attempted.
- The letter "E" (error) will be displayed if a track number not on the disc is specified.

⑬ Time mode select button

Use this button to select the desired time display mode.

- ① Disc remaining playing time.
- ② Track number and remaining playing time of the current track.
- ③ Playing time from the beginning of the first track.
- ④ Track number and elapsed playing time from the beginning of the current track.

⑭ Tape side (A/B) select button

Press this button to indicate the point at which you wish to change cassette sides.

(Used only when the unit is in the stop mode for CD edit play.)

⑮ Edit (tape length) button

Press this button to activate CD edit recording.

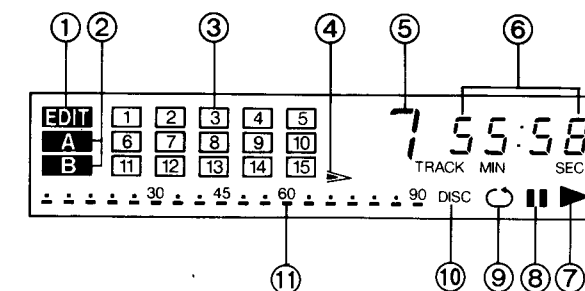
(Use only when the unit is in the stop mode for CD edit recording.)

⑯ Numeric buttons (1 ~ 0)

Use these buttons to specify track numbers.

⑰ Headphones jack

Display Panel



① Edit indicator (EDIT)

Illuminates when the edit button is pressed and goes out when the stop button is pressed.

② Tape side indicator (A, B)

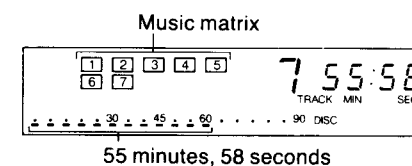
This indicator illuminates to show which cassette side, A or B, has been selected with the tape side (A/B) select button in the stop mode or during edit recording.

- A indicator always illuminates a few seconds after pressing the edit button.
- A indicator illuminates, side A is being played or recorded.
- B indicator illuminates, side B is being played or recorded.

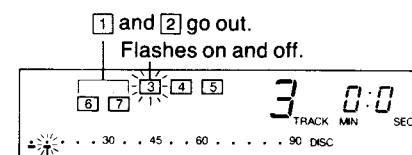
③ Music matrix (□)

The music matrix has the following four display modes.

1. When a disc is loaded, this music matrix shows the total number of tracks (up to 15 tracks). For example, the music matrix below shows that the disc has 7 tracks.



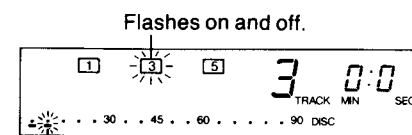
2. If a track number is specified and then play is started. The specified track number is displayed and then play begins. The track number currently being played flashes on and off. For example, if track 3 is specified, the display appears as shown below at the beginning of the track. For example, the diagram below shows that play is to begin from track 3.



Flashes on and off.

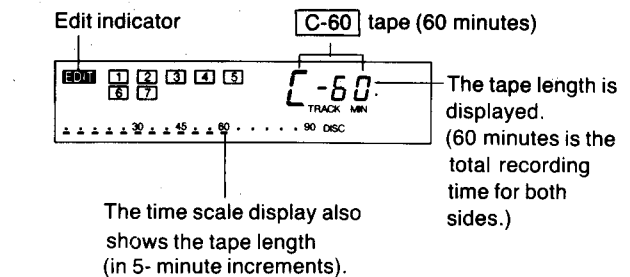
3. If track numbers are programmed and then play is started.

For example, if tracks 3, 5 and 1 are programmed in that order, those three track numbers illuminate and the track being played flashes on and off.



Flashes on and off.

4. Press the edit button and set the tape length. The track number goes out and the tape length is displayed in its place.



④ Over indicator (▶▶)

- ▶▶ Illuminates when a disc containing more than 15 tracks is inserted.
- ▶▶ Flashes on and off when track number 16 or higher is played. (At this time, all music matrix go out.)

⑤ Track number display (TRACK)

Track numbers up to 99 can be shown here.

⑥ Time display (MIN. SEC.)

(The display shows different information depending on which button is pressed.)

1. During play, the current track number and track elapsed playing time is shown.
2. Each time the time mode select button is pressed during play, this display changes to show one of four time modes. (time mode display)
3. If the recall button is pressed during program play, the programmed order is shown on the sec. display. (program confirmation)
4. If the edit button is pressed, the tape length is shown. (CD edit recording)
5. The digital attenuation level (dB) is also displayed here, when using the remote control unit. (digital volume attenuation)

⑦ Play indicator (▶)

Illuminates when the play mode is activated and goes out when play is stopped.

⑧ Pause indicator (||)

Illuminates when the pause mode is activated and goes out when the pause mode is cancelled.

⑨ Repeat indicator (↺)

Illuminates when the repeat mode is activated and goes out when the repeat button is pressed once again.

⑩ Disc indicator (DISC)

Flashes on and off when the disc holder is opening or closing. Illuminates when a disc is in the holder [if power (mains) is on] and the disc holder is closed.

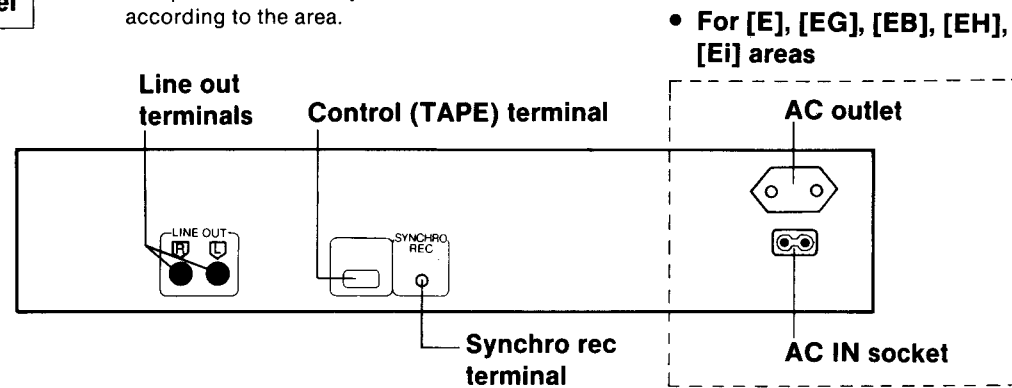
⑪ Time scale display

Time/tape length display

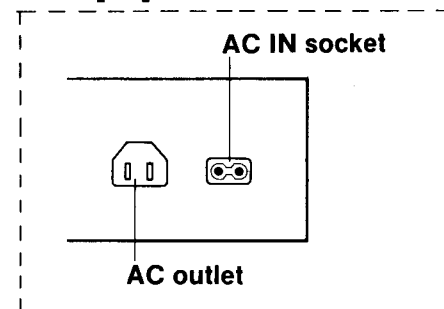
1. The total playing time is displayed in 5-minute increments. During play, an indicator showing the current position on the disc blinks on and off.
2. During CD edit play, the recording time for one cassette side is displayed converted into 5-minute increments, making it easy to figure out exactly how much time remains on the tape.

Rear panel

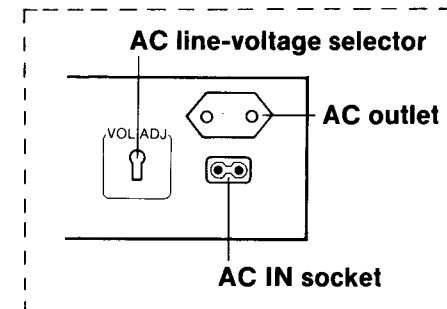
Note: The part surrounded by the broken line differs according to the area.



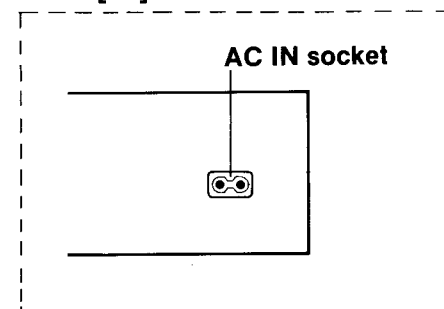
For [EK] area



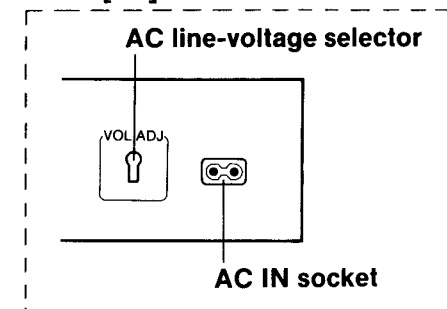
For [XA], [PA], [PE], [PC] areas



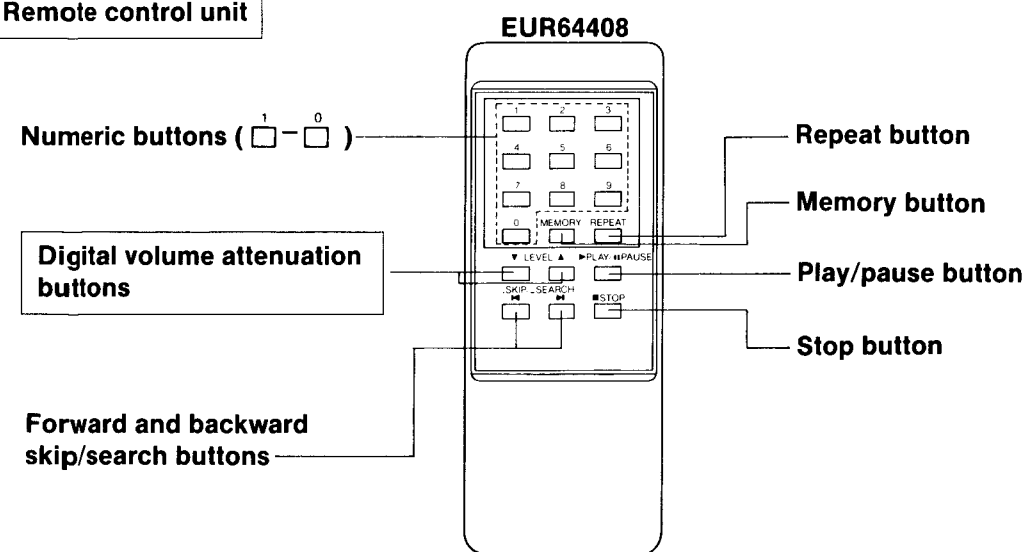
For [XL] area



For [XB] area



Remote control unit

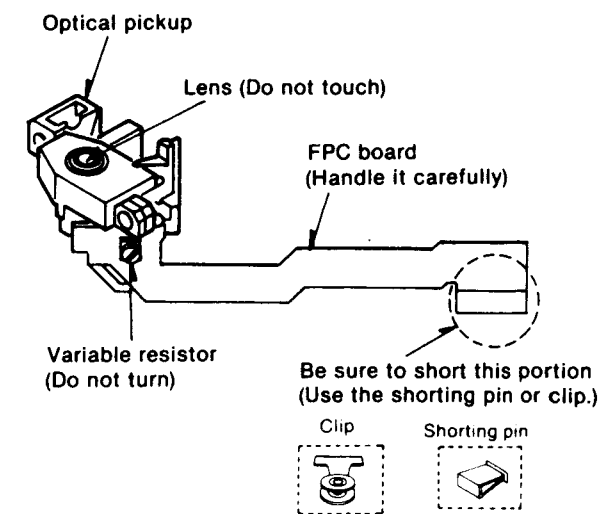


HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body. So, be careful of electrostatic breakdown during repair of the optical pickup.

Handling of optical pickup

1. Do not give excessive shock to the optical pickup because it is of extremely precise structure.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board. (FPC board)
When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board. (FPC board)
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

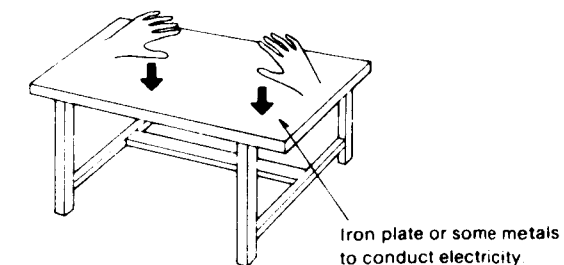
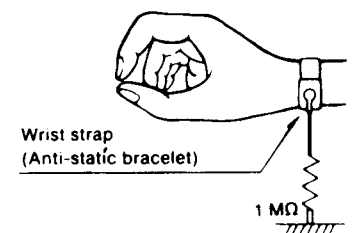


Grounding for electrostatic breakdown prevention

1. Human body grounding
Use the anti-static wrist strap to relieve the static electricity from your body.
2. Work table grounding
Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

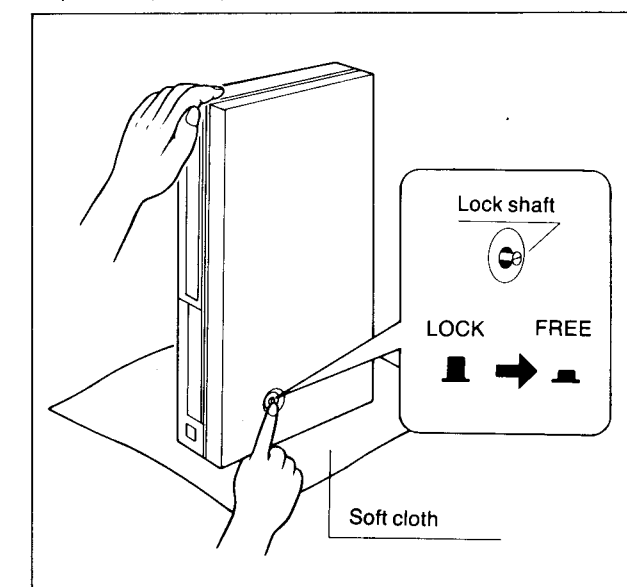
Caution:

The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the optical pickup.



BEFORE USING THIS UNIT

1. Place a soft cloth under the unit to protect it from scratches.
2. Press the lock shaft on the bottom panel to the in (FREE) position (0 - 1).

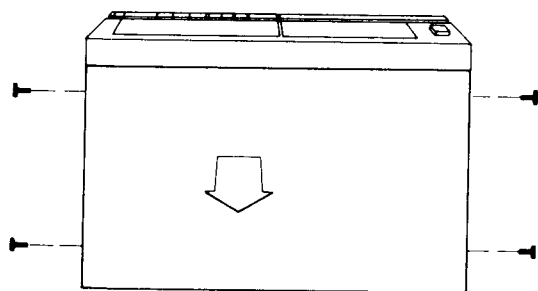
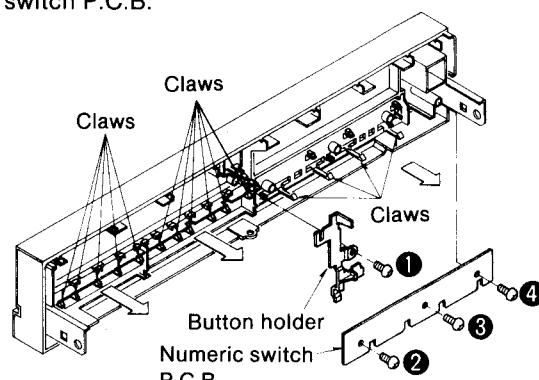
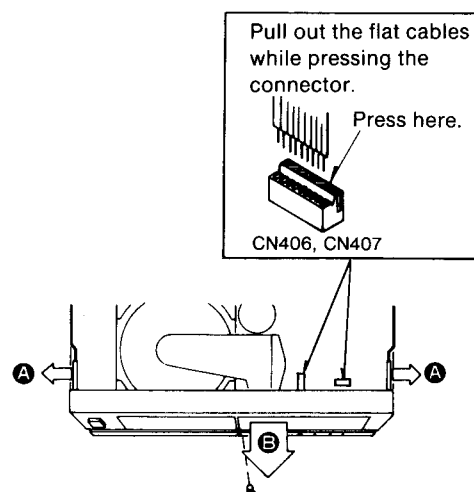
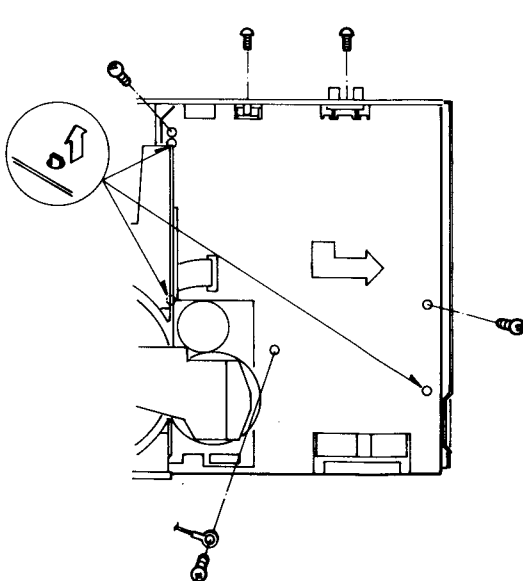


NOTE:
IF THE UNIT IS TRANSPORTED AGAIN, PERFORM THE FOLLOWING STEPS:
1) Remove the disc from the holder.
2) Pull the lock shaft to the out (LOCK) position (1 - 0).
CAUTION:
Do not transport the unit without locking the lock shaft. **SEVERE DAMAGE WILL RESULT.**

■ DISASSEMBLY INSTRUCTIONS

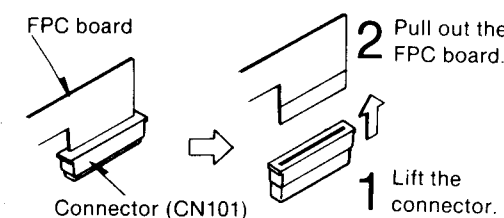
CAUTION:

- It is very dangerous to look at or touch laser radiation. (Laser radiation is invisible.)
- With the unit turned "on", laser radiation is emitted from the pickup lens.
- When doing the job, removing the cabinet and disc clasper of this unit, be sure to turn the power supply off.

Ref. No. 1	How to remove the cabinet	Ref. No. 3	How to remove the operation buttons
Procedure 1	• Remove the 4 setscrews.	Procedure 1 → 2 → 3	
	 Note: When doing the job, Lock the lock shaft at the bottom of the unit. (See page 6.)		• How to remove the operation buttons 1. Remove the screw ① and remove the holder. 2. Release the 11 claws. • How to remove the program buttons. 1. Remove the 3 screws (② ~ ④). 2. Release the 4 claws and remove the numeric switch P.C.B. 
Ref. No. 2	How to remove the front panel	Ref. No. 4	How to remove the main P.C.B.
Procedure 1 → 2		Procedure 1 → 2 → 4	
	1. Remove the screw. 2. Pull out the 2 flat cables (CN406, CN407). 3. Slightly pull the tabs outward (arrows ①). 4. Remove in the direction of arrow ②. 		1. Remove the 5 screws. 2. Lift up the P.C.B. to remove it from the chassis tabs. 3. Remove in the direction of the arrow. 

How to check the main P.C.B.

- When checking the soldered surface of the main P.C.B. and replacing the parts, do as shown.
1. Remove the main P.C.B.
 2. Remove the FPC board (CN101).



Caution: Insert the short pin into the FPC board in order to prevent breakdown of laser diode. (See page 6.)

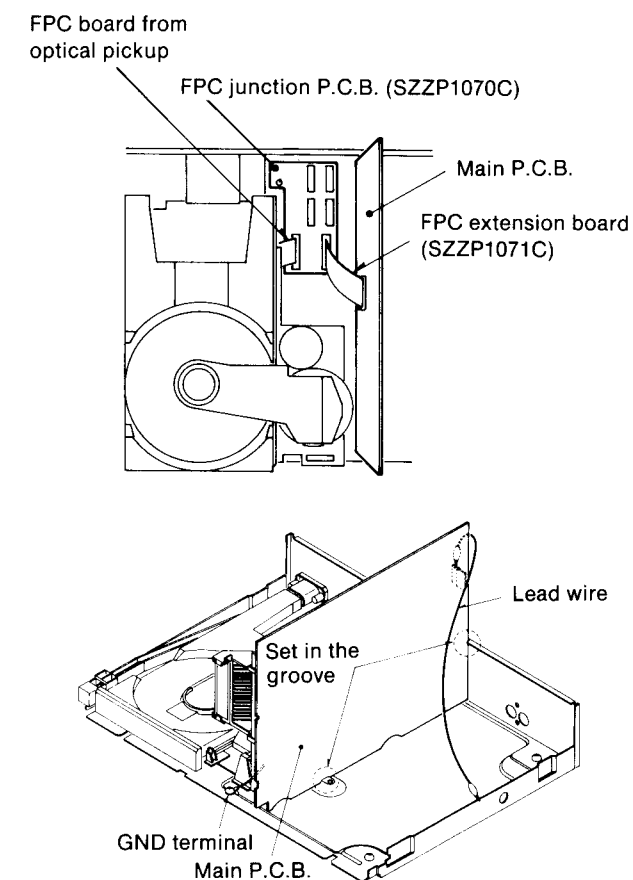
3. Connect FPC board from optical pickup to FPC junction P.C.B. (SZZP1070C).

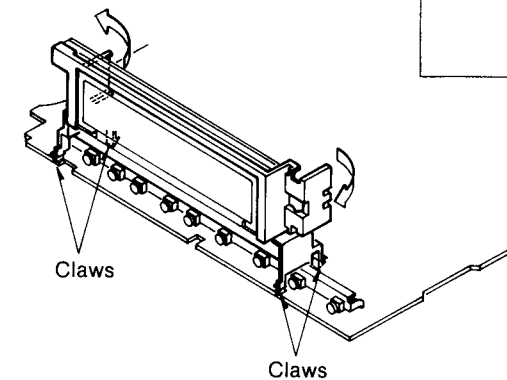
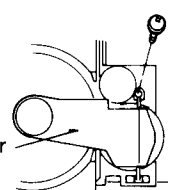
Caution: Cover the foil of the FPC junction P.C.B. with friction tape to prevent a short-circuit between the foil and the chassis.

4. Connect FPC extension board (SZZP1071C) to FPC junction P.C.B. and CN101 of main P.C.B.
5. Place the main P.C.B. as shown in the figure.

Cautions:

- Be sure to connect the P.C.B. ground terminal (line out terminal) and chassis with a lead wire.
- Connect the ground wire of the loading base to the chassis.



Ref. No. 5	How to remove the FL (display)	Ref. No. 6	How to remove the disc clasper
Procedure 1 → 2 → 4 → 5		Procedure 1 → 6	
	1. Unsolder the terminals of the FL. 2. Open the stoppers in the direction of the arrows. 3. Remove the FL from the P.C.B. 4. Release the 4 claws from the P.C.B. to remove the holder. 		• Remove the screw. 

Ref. No. 7	How to remove the loading base
Procedure 1 → 2 → 7	Refer to the optical pickup handling precautions (See page 6).

- Turn the drive gear in the direction of arrow ①, and shift the disc holder forward.
- Remove the 4 setscrews.

Caution: Note the color of each spring, they must be reinstalled in their original positions.

- Pull out the 3 connectors (CN103, CN401, CN402).
- Remove the FPC board (CN101).

Yellow Silver
Yellow Silver (With a blue mark)
Disc holder

Ref. No. 8	How to remove the disc holder (disc tray)
Procedure 1 → 2 → 6 → 8	

- Set the drive gear as shown below. (Turn it completely to the right, then turn it to the left by about 20° so that the drive gear teeth or projection will not touch the rack of the disc holder.)

Drive gear
Drive gear projection
Leaf switch (S101)

- Push the holder lever backward, (From underneath the loading base.)
- Pull the disc holder and bend the 2 claws of the disc holder stopper of the loading base toward the optical pickup.
- Further pull out the disc holder to remove it.

Stoppers
Optical pickup
Holder lever
Loading base
Disc holder

- Caution for fitting**
When fitting the disc holder, make the drive gear as shown on the left, and then insert the disc holder along the guide of the loading base. After inserting the disc holder completely, turn the drive gear to the right completely.

- To remove the drive gear**
Remove the screw ① of the leaf switch (S101), then remove the drive gear setscrew ②.

Ref. No. 9	How to remove the optical pickup
Procedure 1 → 2 → 7 → 8 → 9	- Remove in the numerical order shown. Note: Lock the lock shaft at the bottom of the unit. (See page 6.)

1 Remove the screw.
Resistance unit (Speed sensor)
2 Remove the resistance unit.
3 Unsolder the 2 terminals.
4 Remove the 2 screws ②. (Underneath)
5 Remove the 3 setscrews ①.
6 Pull out the optical pickup from the 2 guide shafts.
Guide shafts

Ref. No. 10	How to remove the drive motor
Procedure 1 → 2 → 7 → 10 →	Remove in the numerical order shown.

2 Remove the 2 screws.
1 Remove the drive belt.
5 Lift up the drive motor.
3 Remove the screw.
4 Release the 2 Tabs in the direction of the arrows.
Tabs
Leaf switch (S101)
Drive belt

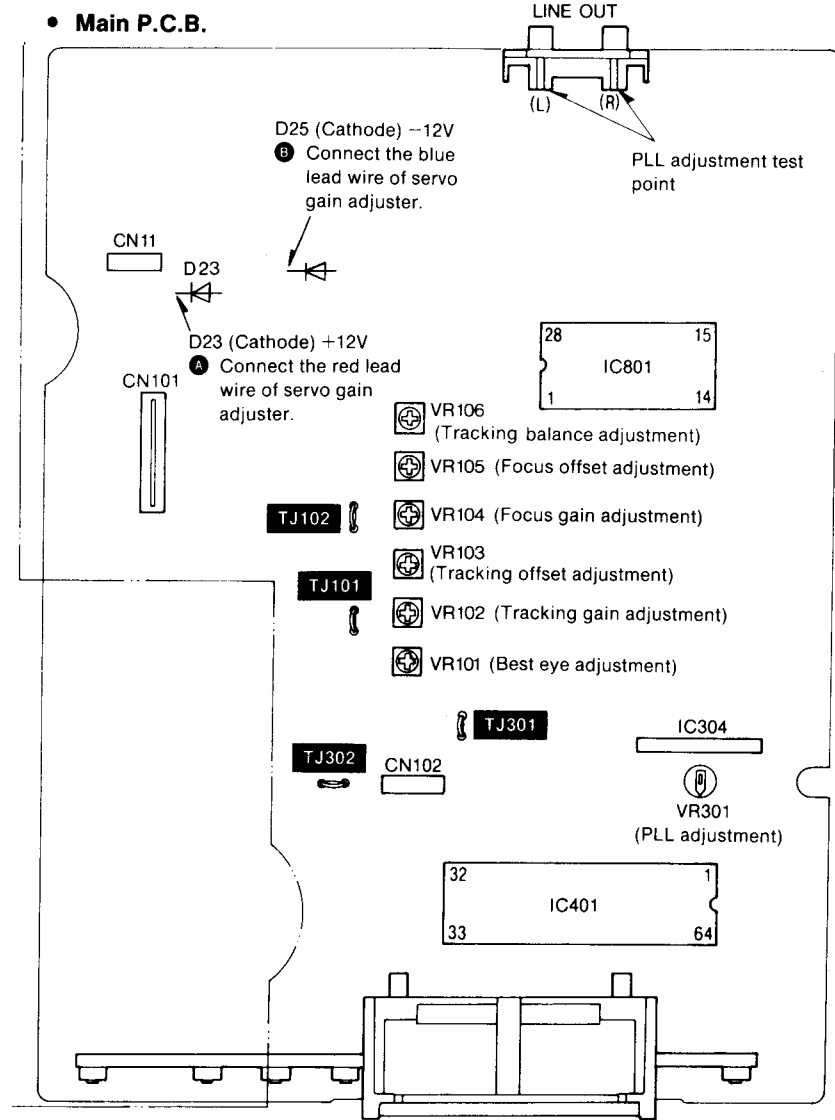
Ref. No. 11	How to remove the power transformer
Procedure 1 → 11	- Remove the connector (CN11). - Remove the 2 screws. - Unsolder the 2 terminals from the AC outlet. - Lift the power transformer to remove it from the chassis tab. (arrow ①) - Remove the power source P.C.B. in the direction of the arrow ②. How to remove the AC outlet - Unsolder the 2 terminals from the AC outlet. - Release the 2 claws. - Remove in the direction of the arrow ③. How to remove the power switch rod - Set the power switch in "OFF" position. - Remove the power switch rod by using a screwdriver.

Caution for fitting: Fit the P.C.B. to the groove of the chassis.

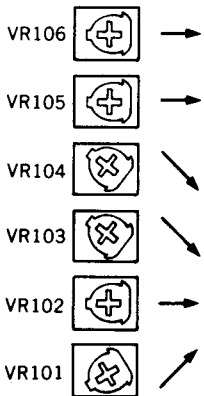
AC outlet
Terminals
Claws
CN11
Driver

MEASUREMENTS AND ADJUSTMENTS

ADJUSTMENT POINTS



Temporary setting of each VR

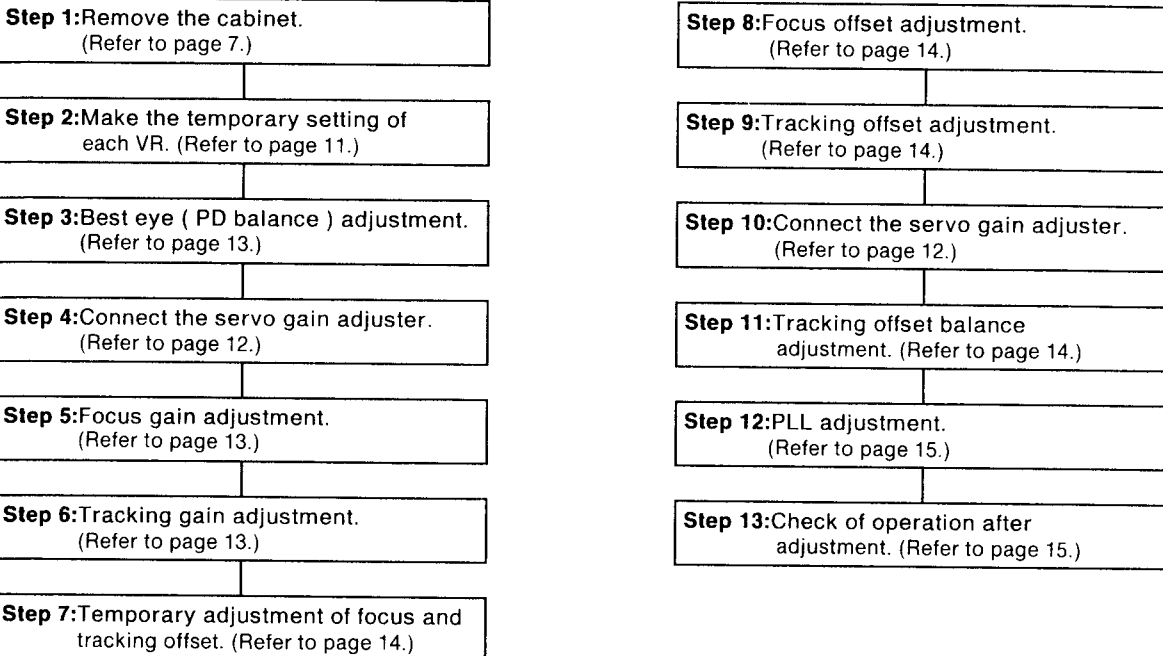


ELECTRICAL ADJUSTMENT

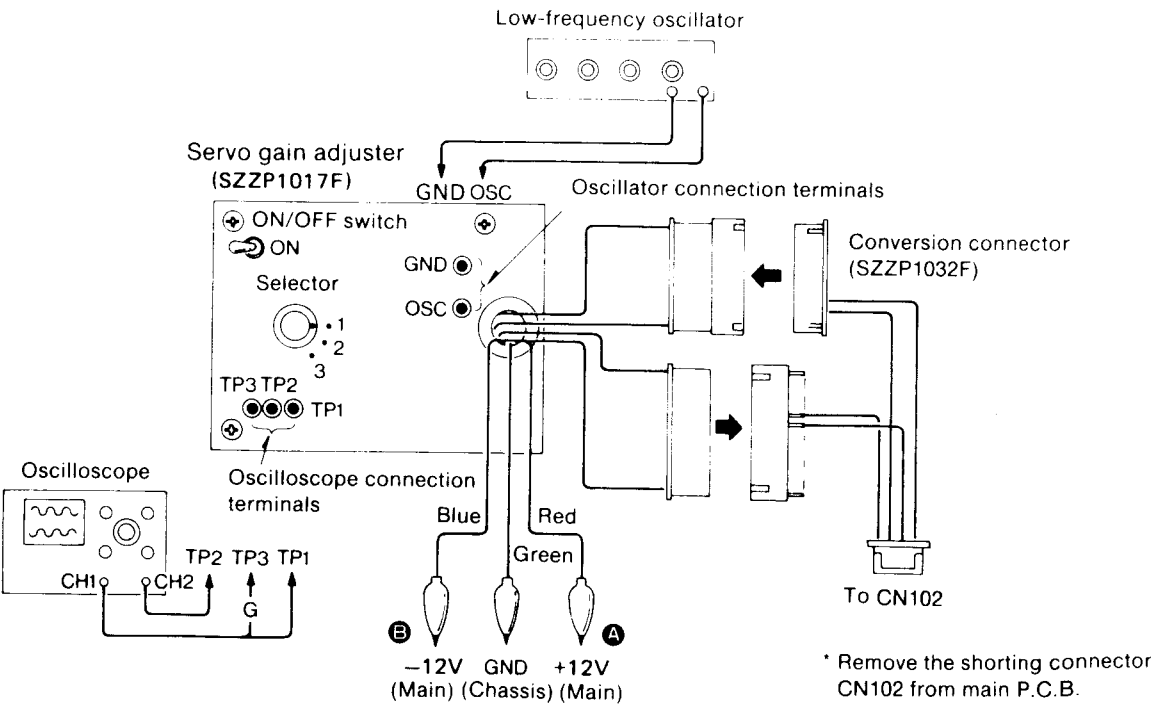
Measuring Instruments and Special Tools

- Servo gain adjuster (SZZP1017F)
- Test discs
 - Test disc (SZZP1014F) old or new type
 - Inspection test disc (SZZP1054C)
 - Uneven disc (SZZP1056C)
 - Black band disc (SZZP1057C)
- Ordinary disc
- Two-channel oscilloscope (with trigger) of 30MHz or over
- Low frequency oscillator
- Conversion connector (SZZP1032F)

Adjustment Procedure

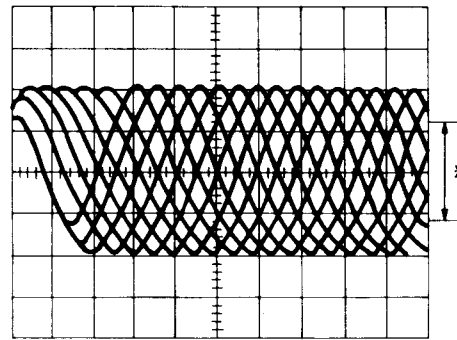


Connection of Servo Gain Adjuster



BEST EYE(PD BALANCE) ADJUSTMENT

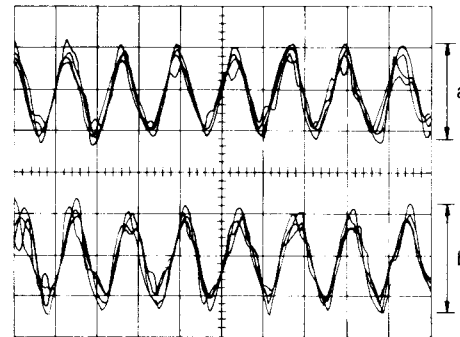
1. Connect CH1 of the oscilloscope to **TJ301 (+)** and **TJ302 (-)** of the main P.C.B.
Oscilloscope setting: VOLT.....200mV
SWEEP.....0.5μsec.
INPUT.....AC
2. Turn **ON** the power switch of the player and insert the test disc (SZZP1014F or SZZP1054C).
3. Set the player to the play mode.
4. Adjust **VR101** so that the eye pattern of RF signal is stretched to maximum.
5. Turn **OFF** the power switch of the player.



*Most stretched eye pattern

FOCUS GAIN ADJUSTMENT

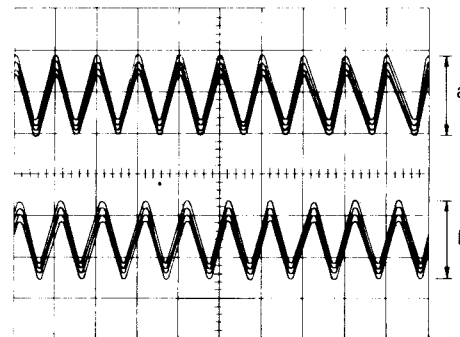
1. Connect the servo gain adjuster. (Refer to page 12.)
2. Set the selector switch of the servo gain adjuster to **2** and ON-OFF switch to **ON**.
3. Set the low frequency oscillator to a frequency of **750Hz** and an output voltage of **100mVp-p**. Then connect the oscillator to **OSC (+)** and **GND (-)** terminals of the servo gain adjuster.
4. Connect CH1 and CH2 of the oscilloscope to **TP1** and **TP2** of the servo gain adjuster. (TP3 is the ground terminal.)
Oscilloscope setting: VOLT.....200mV(both channels)
SWEEP.....1msec.
INPUT.....DC
5. Turn **ON** the power switch of the player and insert the test disc (SZZP1014F or SZZP1054C).
6. Set the player to the play mode.
7. Set the selector switch of the servo gain adjuster from **"2" to "3"**.
8. **750Hz** signals will be displayed on the oscilloscope. Adjust **VR104** until the waveform amplitudes of both channels are equal.
9. Shift the selector switch of the servo gain adjuster from **"3" to "2"**.
10. Turn **OFF** the power switch of the player.



*Make a=b

TRACKING GAIN ADJUSTMENT

1. Set the low frequency oscillator to a frequency of **1.0kHz** and an output voltage of **100mVp-p**. Then connect the oscillator to **OSC (+)** and **GND (-)** terminals of the servo gain adjuster.
2. Connect CH1 and CH2 of the oscilloscope to **TP1** and **TP2** of the servo gain adjuster. (TP3 is the ground terminal.)
Oscilloscope setting: VOLT.....200mV(both channels)
SWEEP.....1msec.
INPUT.....DC
3. Turn **ON** the power switch of the player and insert the test disc (SZZP1014F or SZZP1054C).
4. Set the player to the play mode.
5. Set the selector switch of the servo gain adjuster from **"2" to "1"**.
6. **1.0kHz** signals will be displayed on the oscilloscope. Adjust **VR102** until the waveform amplitudes of both channels are equal.
7. Shift the selector switch of the servo gain adjuster from **"1" to "2"**.
8. Turn **OFF** the power switch of the player.
9. Disconnect the servo gain adjuster, and insert the shorting connector of CN102 to the original position.



*Make a=b

TEMPORARY ADJUSTMENT OF FOCUS AND TRACKING OFFSET

(Temporary adjustment of focus offset)

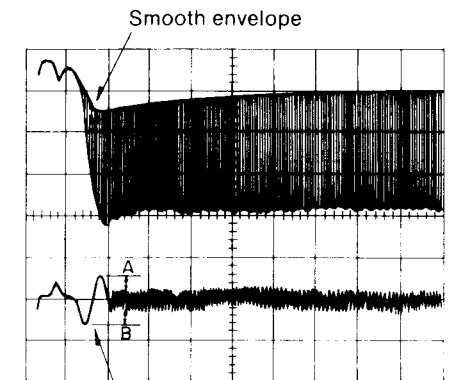
1. Connect CH1 of the oscilloscope to **TJ102 (+)** and **TJ302 (-)** of the main P.C.B.
Oscilloscope setting: VOLT.....100mV
SWEEP.....5msec.
INPUT.....DC
2. Turn **ON** the power switch of the player and insert the test disc (SZZP1057C).
3. After the player read TOC , adjust **VR105** so that the voltage waveform center on the oscilloscope is **0mV**.

(Temporary adjustment of tracking offset)

1. Connect CH1 of the oscilloscope to **TJ101 (+)** and **TJ302 (-)** of the main P.C.B.
Oscilloscope setting: VOLT.....100mV
SWEEP.....5msec.
INPUT.....DC
2. Turn **ON** the power switch of the player and insert the test disc (SZZP1057C).
3. After the player read TOC , adjust **VR103** so that the voltage waveform center on the oscilloscope is **0mV**.

FOCUS OFFSET ADJUSTMENT

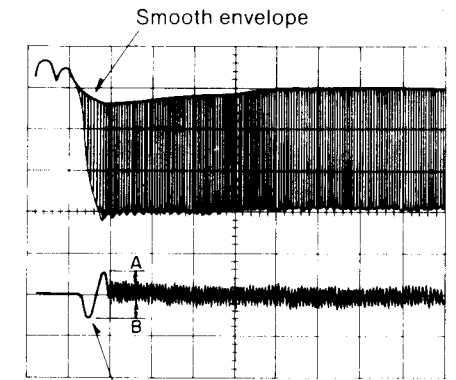
1. Connect CH1 of the oscilloscope to **TJ301 (+)** and **TJ302 (-)** of the main P.C.B.
Connect CH2 of the oscilloscope to **TJ102 (+)** and **TJ302 (-)** of the main P.C.B.
Oscilloscope setting: VOLT.....200mV(both channels)
SWEEP.....0.5msec.
INPUT.....AC(CH1),DC(CH2)
MODE.....NORM
(Triggering via CH1)
2. Turn **ON** the power switch of the player and insert the test disc (SZZP1057C).
3. Set the player to the play mode.
4. Check the waveform of CH1 and CH2 on the oscilloscope and adjust **VR105** , so that the waveform around the triggering point becomes as shown in the illustration.



Minimize the amplitude or make A=B

TRACKING OFFSET ADJUSTMENT

1. Connect CH1 of the oscilloscope to **TJ301 (+)** and **TJ302 (-)** of the main P.C.B.
Connect CH2 of the oscilloscope to **TJ101 (+)** and **TJ302 (-)** of the main P.C.B.
Oscilloscope setting: VOLT.....200mV(both channels)
SWEEP.....0.5msec.
INPUT.....AC(CH1),DC(CH2)
MODE.....NORM
(Triggering via CH1)
2. Turn **ON** the power switch of the player and insert the test disc (SZZP1057C).
3. Set the player to the play mode.
4. Check the waveform of CH1 and CH2 on the oscilloscope and adjust **VR103** , so that the waveform around the triggering point becomes as shown in the illustration.

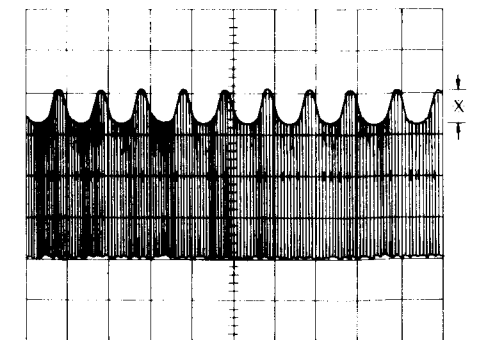


Minimize the amplitude or make A=B

TRACKING OFFSET BALANCE ADJUSTMENT

1. Connect the servo gain adjuster. (Refer to page 12.)
2. Set the selector switch of the servo gain adjuster to **2** and ON-OFF switch to **ON**.
3. Set the low frequency oscillator to a frequency of **1kHz** and an output voltage of **200mVp-p**. Then connect the oscillator to **OSC (+)** and **GND (-)** terminals of the servo gain adjuster.
4. Connect CH1 of the oscilloscope to **TJ301 (+)** and **TJ302 (-)** of the main P.C.B.
Oscilloscope setting: VOLT.....200mV
SWEEP.....0.5msec.
INPUT.....AC
5. Turn **ON** the power switch of the player and insert the test disc (SZZP1014F or SZZP1054C).
6. Set the player to the play mode.
7. Set the selector switch of the servo gain adjuster from **"2" to "1"**.
8. Adjust **VR106** so that the output waveform is as shown (jitter is minimized).

9. Shift the selector switch of the servo gain adjuster from **"1" to "2"**.
10. Turn **OFF** the power switch of the player.
11. Disconnect the servo gain adjuster, and insert the shorting connector of CN102 to the original position.



*Jitter should be minimized.

PLL ADJUSTMENT

1. Connect CH1 of the oscilloscope to the **LINE OUT terminal** (either of Lch or Rch) and **ground**.

Oscilloscope setting: VOLT.....1V
SWEEP.....1msec.
INPUT.....DC

2. Turn **ON** the power switch of the player and insert the test disc (SZZP1054C).

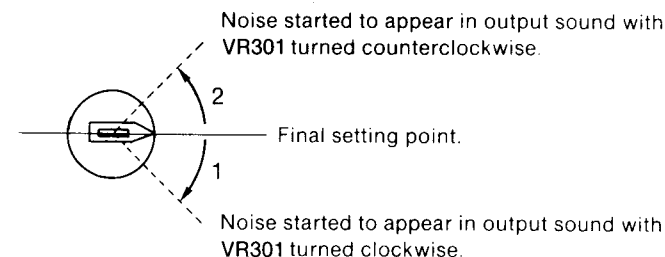
3. Play track No.6 (wedge 0.7 mm) of the test disc.

4. Check the waveform displayed on the oscilloscope and adjust **VR301** in the following steps.

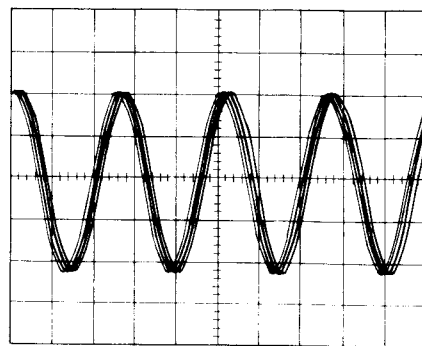
Step 1. Turn **VR301** clockwise slowly and observe the point at which the waveform on the oscilloscope begins to be disturbed.

Step 2. Turn **VR301** counterclockwise slowly and observe the point at which the waveform on the oscilloscope begins to be disturbed.

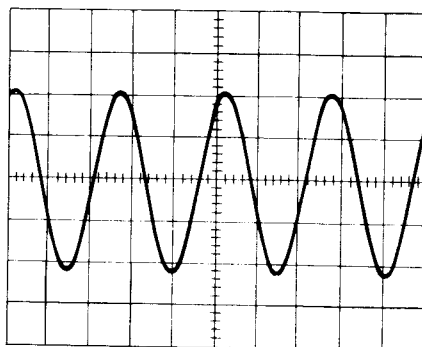
Step 3. Set **VR301** in the middle between the points observed in the above steps "1" and "2".



• NG



• OK



CHECK OF PLAY OPERATION AFTER ADJUSTMENT

Check of skip search

1. Play an ordinary disc.
2. Press the skip button and verify skip search operation (forward and reverse).

Check of manual search

1. Play an ordinary disc.
2. Press the manual search button and verify that smooth manual search can be performed at low and high speeds (forward and reverse).

Check of playability

1. Play the test disc (SZZP1054C).
2. Play the track No.6 (wedge 0.7 mm) and verify that there is no skip sound or noise.
3. Play the track No.13 (black dot 0.7 mm) and verify that there is no skip sound or noise.

OPTICAL PICKUP ADJUSTMENT

Measuring Instruments and Special Tools

- Two-channel oscilloscope (with trigger) of 30MHz or over
- Test discs
 - Test disc (SZZP1014F) old or new type
 - Inspection test disc (SZZP1054C)
 - Uneven disc (SZZP1056C)
- Hexagonal wrench (SZZP1044C....1.5mm)
- Screw lock paint (RZZ0L01)

Adjustment Procedure

- If the optical pickup is replaced, adjust it according to the following procedure.

Step 1: Assemble the set to make it ready for power ON check.

Step 2: Make the temporary setting of each VR. (Refer to page 11.)

Step 3: Turntable height adjustment. (Refer to page 16.)

Step 4: Mechanical adjustment. (Refer to page 16.)

Step 5: Electrical adjustment. (Refer to page 12.)

TURNTABLE HEIGHT ADJUSTMENT

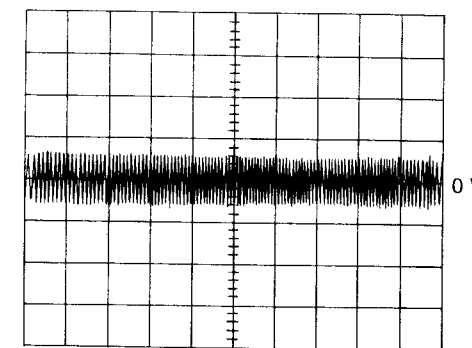
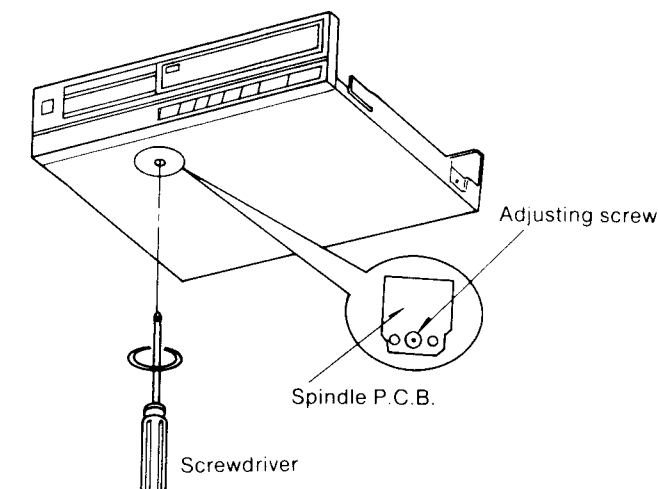
1. Connect CH1 of the oscilloscope to **TJ102 (+)** and **TJ302 (-)** of the main P.C.B.

Oscilloscope setting: VOLT.....100mV
SWEEP.....5msec.
INPUT.....DC

2. Set the oscilloscope to DC zero balance.

3. Turn **ON** the power switch of the player and insert the test disc (SZZP1014F or SZZP1054C).

4. Set the player to the play mode.



5. Turn the **adjusting screw** at the bottom of the spindle motor drive P.C.B. with a flat screwdriver so that the waveform is balanced at **0 ± 50mV**.

6. Turn **OFF** the power switch of the player.

7. After the adjustment, apply **screw lock paint(RZZ0L01)** to the adjusting screw.

MECHANICAL ADJUSTMENT

1. Connect CH1 of the oscilloscope to **TJ301 (+)** and **TJ302 (-)** of the main P.C.B.

Oscilloscope setting: VOLT.....200mV
SWEEP.....0.5μsec.
INPUT.....AC

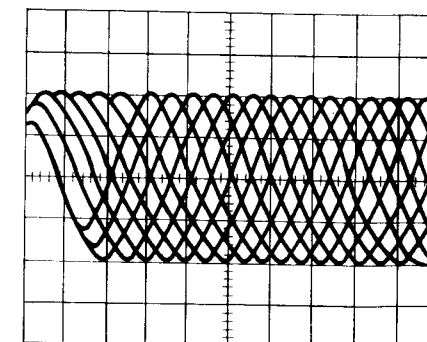
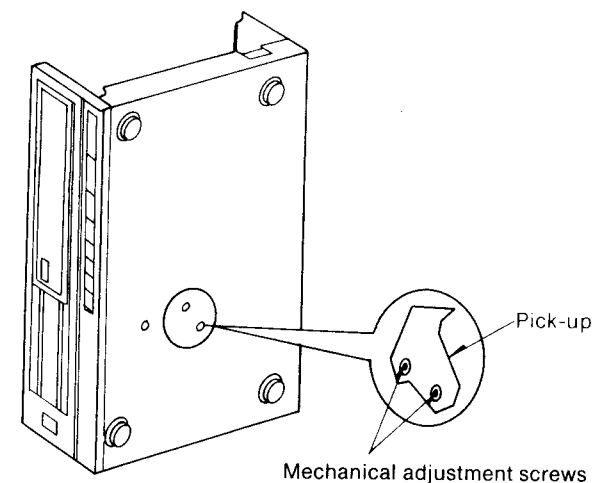
2. Turn **ON** the power switch of the player and insert the test disc (SZZP1056C).

3. Play track No.9 of the test disc.

4. Monitoring RF signal on the oscilloscope, adjust the **two adjusting screws** alternately so that the vertical fluctuation of RF signal is minimized and the eye pattern is most stretched.

5. Turn **OFF** the power switch of the player.

6. After the adjustment, apply **screw lock paint(RZZ0L01)** to the adjusting screws.



Note: The mechanical adjustment screws have been already locked with screw lock paint at the factory. It might be hard to turn them.

■ TERMINAL FUNCTION OF LSI

● MN6617S (Digital Signal Processing: EFM Decoder, Error Correction, CLV Servo)

Pin No.	Mark	I/O	Function	Pin No.	Mark	I/O	Function
1	BLKCK	O	Sub-code block (Q data) clock (75 Hz)	34	DA8/FCLV	O	16-bit data output/Synchronizing detection signal (Not used)
2	CLDCK	O	Sub-code frame (Q data) clock (7.35 kHz)	35	DA7/IPBYTE	O	16-bit data output/Interpolation flag for each byte (Not used)
3	SUBQ	O	Sub-code (Q data) output	36	DA6/IPSEL	I/O	16-bit data output/interpolation inhibit (Not used)
4	CRC	O	Sub-code (Q data) CRC check (Not used, open)	37	DA5/FLAG5	O	16-bit data output/C2 decoder correction flag 3 (Not used)
5	RST	I	Reset signal input (reset at "L")	38	DA4/FLAG4	O	16-bit data output/C2 decoder correction flag 2 (Not used)
6	MLD	I	Command load input	39	DA3/FLAG3	O	16-bit data output/C2 decoder correction flag 1 (Not used)
7	MCLK	I	Command clock input	40	DA2/FLAG2	O	16-bit data output/C1 decoder correction flag 2 (Not used)
8	MDATA	I	Command data input	41	DA1/FLAG1	O	16-bit data output/C1 decoder correction flag 1 (Not used)
9	DMUTE	I	Muting control (muting ON at "H")	42	DA0/FLCK0	O	16-bit data output/Crystal frame clock
10	TRON	I	Tracking servo ON signal (tracking servo ON at "L")	43 } 50	D7 } D0	I/O	16 K RAM data output
11	STAT	O	Processing condition (CRC, OTC, CLVOK, TT STOP) output	51	RAMOE	O	
12	SMCK	O	Clock output (4.2336 MHz)	52	RAMWE	O	16 K RAM WE signal
13	PMCK	O	Pitch control clock output (Not used, open)	53 } 63	RAMA 0 } RAMA10	O	16 K RAM address signal (RAMA0 : LSB, RAMA10: MSB)
14	ITC	I	Track counter input signal (Not used, connected to +5V)	64	PC	O	
15	TEST	I	Test mode selection	65	EC	O	Spindle motor ON signal (ON at "L")
16	X2	O	Clock output (16.9344 MHz)	66	FG	I	Spindle motor FG signal input (Not used, open)
17	X1	I	Clock input (16.9344 MHz)	67	VCNT	—	Connected to GND
18	SEL	I	DA output parallel/serial selection (serial at "L")	68	REXT	—	Connected to GND
19	LDG/WDCK	O	L channel deglitch signal/serial data word clock.	69	VDD1	—	Connected to +5 V
20	RDG	O	R channel deglitch signal.	70	PD	—	Not used, open
21	DEMPH	O	De-emphasis ON signal (de-emphasis ON at "H")	71	PCKO	—	Not used, open
22	IPFLAG	O	Interpolation flag (interpolation at "H")	72	PCK	I	PLL extract clock input
23	FLAG0	O	Error flag (error at "H")	73	VDD	I	Power supply (connected to +5V)
24	FLAG6	O	16 K RAM address reset signal (reset at "H") (Not used, open)	74	EFM	I	EFM signal input (PLL)
25	XCK	O	Clock (16.9344 MHz) output (Not used, open)	75	SRF	I	EFM signal input (DSL)
26	DA15/SRDATA	O	16-bit data output/serial data output (MSB first)	76	DO	I	Drop-out signal (Drop-out at "H")
27	DA14/SRDATAx	O	16-bit data output/serial data output (LSB first)	77	CLVS	O	11T servo OK signal (OK at "H")
28	DA13/SRCK	O	16-bit data output/serial data beat clock.	78	FPC	O	PLL frequency comparison signal
29	DA12/WDCK	O	16-bit data output/serial data word clock (Not used)	79	BSSEL	O	PLL frequency in take operation signal.
30	DA11/BYTCK	O	16-bit data output/serial data byte clock (Not used)	80	SRFO	—	—
31	GND	I	GND terminal	81	NSRF	—	—
32	DA10/R/L	O	16-bit data output R/L signal	82	RF	—	—
33	DA9/RESY	O	16-bit data output/Resynchronizing signal	83	SUBC	O	Sub-code serial output data
				84	SBCK	I	Clock for sub-code serial output

● MN15283PDQ (System Control and FL Drive)

Pin No.	Mark	Signal	I/O	Function	Pin No.	Mark	Signal	I/O	Function
1	VSS	GND	I	GND terminal	26	P31	CNT3	O	Optical servo IC control signal (KICKF: Kick direction [Forward] command)
2	XO	—	O	Not used (Open)	27	P32	CNT2	O	Optical servo IC control signal (TRON: Tracking servo)
3	XI	SENSE	I	Track-cross input	28	P33	CNT1	O	Optical servo IC control signal (FOON: Focus servo)
4	P00	MRLY	O	Muting relay control	29	P40	START	I	Key input strobe and processing status input from signal processing LSI traverse position detection.
5	P01	M DATA	O	Command data outut	30	P41	D-END	O	(Not used, open)
6	P02	MCLK	O	Command clock output	31	P42	FLOCK	I	Optical servo condition (focus) input
7	P03	MLD	O	Command load output	32	P43	SENSE	I	Optical servo condition (track cross) input
8	P10	EST	I	Deck control input	33	PE0	CLOSE	O	Loading motor close signal
9	P11	CRM	I	Deck control input	34	PE1	OPEN	O	Loading motor open signal
10	P12	SYNC	O	Synchro jack input	35	P60	DAC	O	Not used, open
11	P13	D-DP	O	Synchro jack input	36	VPP	—	O	Power supply
12	SYNC	—	O	(Not used, open)	37	PLE	—	O	Tape control signal
13	RST	RESET	I	Reset signal input (reset at "L")	38	CEM	—	O	Tape control signal
14	IRQ	BLKCK	I	Sub-code block (Q data) clock (75 Hz) input	39 } 52	D0 } DD	—	O	FL grid signal and key scan signal
15 } 18	P50 } P53	KEY	I	Key scan input	53 } 61	S8 } S0	—	O	
19	SBT	CLDCK	I	Sub-code frame clock (7.35 kHz)	62	VDD	—	I	Power supply (connected to +5V)
20	SBD	SUBQ	I	Sub-code Q data input	63	OSC2	—	I	Clock terminal
21	P20	TGC	O	(Not used, open)	64	OSC1	—	I	Clock input
22	P21	TRV-H	O	(Not used, open)					
23	P22	TRV-R	O	Traverse reverse command signal					
24	P23	TRV-F	O	Traverse forward command signal					
25	P30	CNT4	O	Optical servo IC control signal (KICKR: Kick direction [Reverse] command)					

● MN1550PDT (Remote Control Signal Processing)

Pin No.	Mark	Signal	I/O	Function	Pin No.	Mark	Signal	I/O	Function
1	VDD	—	I	Power supply (connected to +5V)	9	P31	SYNC	O	Not used, open
2	OSC1	SMCK	I	Clock input	10 } 13	P13 } P10	Data	I	Key strobe
3	P23	—	—	Not used, open	14 } 17	P03 } P00	Data		
4	P22	—	—	Not used, open	18	VSS	GND	I	GND terminal
5	RST	RESET	I	Reset signal input					
6	P21	—	—	Not used, open					
7	P20	—	I	Remote control signal input					
8	IRQ	—	I	Program enable/de-enable control					

• MN6618A (Digital Filter)

Pin No.	Mark	I/O	Function	Pin No.	Mark	I/O	Function
1	NC	—	Not connected	23	MCLK	I	Command clock input
2	D012	O	16-bit data output	24	MLD	I	Command load input
3	D011	O	16-bit data output	25	NC	—	Not connected
4	D010	O	16-bit data output	26	RST	I	Reset signal input (reset at "L")
5	GND	I	GND terminal	27	---	---	---
6	D09	O	16-bit data output	28	R/L	I	L/R channel changeover signal
7	NC	—	Not connected	29	NC	—	Not connected
8	D08	O	16-bit data output	30	SFT	I	Serial data input clock
9	D07	O	16-bit data output	31	SIN	I	Serial data input
10	NC	—	Not connected	32	NC	—	Not connected
11	NC	—	Not connected	33	X OUT	O	Clock output (Not used, open)
12	D06	O	16-bit data output	34	X IN	I	Clock input (16.9244 MHz)
13	D05	O	16-bit data output	35	OSEL	I	DA output parallel/serial changeover (Parallel at "L")
14	D04	O	16-bit data output	36	LDGL	O	L channel deglitch signal
15	D03	O	16-bit data output	37	RDGL	O	R channel deglitch signal
16	NC	—	Not connected	38	VDD	I	Power supply (connected to +5V)
17	NC	—	Not connected	39	D015	O	16-bit data output (MSB)
18	D02	O	16-bit data output	40	D014	O	16-bit data output
19	D01	O	16-bit data output	41	NC	—	Not connected
20	D00	O	16-bit data output	42	D013	O	16-bit data output
21	MDATA	I	Command data input				
22	NC	—	Not connected				

• AN8290S (Spindle Motor Drive)

Pin No.	Mark	I/O	Function	Pin No.	Mark	I/O	Function
1	GND	I	Minimum potential of IC control. (In this unit, it is connected to VEE [−8.5V])	13	NC	I	Not used in this unit.
2	DCR	I	Standard voltage of FAI, PC, CLK. (In this unit, it is connected to 2.5V.)	14	NC	I	
3	FAI	I	Torque command filter amp. input. (Normal rotation command when FAI < DCR.)	15	H2−	I	Negative output of Hall element is input.
4	FAO	O	Filter amp. output.	16	H2+	I	Positive output of Hall element is input.
5	DI	I	Absolute value circuit input.	17	H1−	I	Negative output of Hall element is input.
6	LPF	I	Capacitor terminal for low pass filter of current feedback loop.	18	H1+	I	Positive output of Hall element is input.
7	A1	O	Drive signal output.	19	HSW	I	Bias switch of Hall element. (OFF when PC > DCR)
8	A2	O		20	HB	I	Bias power of Hall element.
9	A3	O		21	VCC	I	Power input for IC control.
10	PGND	I	Minimum potential of IC power. (In this unit, it is connected to VEE [−8.5V])	22	PC	I	Power control. (Power down mode when PC > DCR)
11	CS	I	Drive current detection resistor terminal.	23	CLK	I	Clock input. (DCR standard, operated at the edge of rise.)
12	PVCC	I	Power input for IC power.	24	TC	I	Triangular wave generation capacitor terminal.

• AN8370S (Optical Servo Control)

Pin No.	Mark	I/O	Function	Pin No.	Mark	I/O	Function
1	VEE	I	Power supply (connected to −5V)	22	CNT1	I	Control input (FOON: Focus servo ON signal)
2	LSA	I	Phase difference input (A)	23	CNT2	I	Control input (TRON: Tracking servo ON signal)
3	GND	I	GND terminal	24	CNT3	I	Control input (KICKF: Kick direction [Forward] command)
4	LSB	I	Phase difference input (B)	25	CNT4	I	Control input (KICKR: Kick direction [Reverse] command)
5	APC	O	Auto laser power control output	26	F-LOCK	O	Focus lock signal output
6	TEOUT	O	Tracking error signal output	27	C-FBDO	O	Capacitor connection for inversion RF high speed detection
7	TEG	I	Tracking error gain adjusting input	28	C-SBDO	O	Capacitor connection for inversion RF low speed detection
8	TE+	I	Phase difference-to-voltage conversion (+)	29	C-SBRT	O	Capacitor connection for non-inversion RF low speed detection
9	TE−	I	Phase difference-to-voltage conversion (−)	30	C-FBRT	O	Capacitor connection for non-inversion RF high speed detection
10	APC−	I	Laser power inversion input	31	RF OUT	O	RF signal output
11	C-MEM	I	Capacitor connection for phase difference memory	32	BDO	O	Drop-out detection output
12	APC+	I	Laser power input	33	RF IN	I	RF signal input
13	VREF	O	Reference current generation	34	S-OUT	O	Focus search signal output
14	SENSE	O	Selector output (track-crossed)	35	C-LW	I	Capacitor connection for triangular wave generation
15	HIN	I	Tracking hold circuit input	36	FE-OUT	O	Focus error signal output
16	HOUT	O	Tracking hold circuit output	37	FEG	I	Focus error gain adjusting input
17	SPCNT	O	Track-cross speed control output (not used, open)	38	FE-REF	I	Focus error comparison voltage generation
18	C-MSP	I	Track-cross reference speed setting capacitor connection (not used, open)	39	PDB	I	Photo detector current input (B)
19	C-AF	I	Auto focus timer capacitor connection	40	IVB	O	Current to voltage conversion (B)
20	KICK	O	Track kick signal output	41	IVA	O	Current to voltage conversion (A)
21	VCC	I	Power supply (connected to +5V)	42	PDA	I	Photo detector current input (A)

• EHDGA1243 (Data Slice and PLL)

Pin No.	Mark	I/O Devision	Function	Pin No.	Mark	I/O Devision	Function
1	PCK	O	Clock output extracted from SRF	9	NC	I	VCO free ran frequency adjusting current input (not connected)
2	EFM	O	EFM signal output synchronized with PCK	10	VR	I	Resistor connection for VCO oscillation frequency
3	D-GND	I	GND terminal (digital system)	11	VEE	I	Power supply (connected to −5V)
4	SRF	O	RF signal output data-sliced into digital value	12	VC1	I	Capacitor connection for VCO oscillator frequency
5	SLC	I	Slice level control signal input	13	VC2	I	Capacitor connection for VCO oscillator frequency
6	DO	O	Drop-out detection pulse output	14	A-GND	I	GND terminal (analog system)
7	FPC	I	Frequency comparison error signal input.	15	RF	I	RF signal input
8	VCC	I	Power supply (connected to +5V)				

■ RESISTORS & CAPACITORS

Notes: * Important safety notice:
Components identified by Δ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area.
Parts without these indications can be used for all areas.

Numbering System of Resistor

Example

ERD	25	F	J	102
Type	Wattage	Shape	Tolerance	Value
ERX	2	AN	J	471
Type	Wattage	Shape	Tolerance	Value
				47x10 ¹ (ohm)

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity
ECEA	50		M	330
Type	Voltage		Peculiarity	Value
				(33x10 ⁰ microfarad)

Resistor Type		Wattage	Tolerance
ERD	: Carbon	10 : 1/8W	J : ±5%
ERG	: Metal Oxide	12 : 1/2W	F : ±1%
ERX	: Metal Film	25 : 1/4W	G : ±2%
ERQ	: Fuse Type Metal	1A : 1W	K : ±10%
ERD	L : Carbon (chip)	18 : 1/8W	
ERO	K : Metal Film (chip)	S2 : 1/4W	
ERC	: Solid	S1 : 1/2W	
		2F : 1/4W	
		50 : 1/2W	
		2A : 2W	

Capacitor Type		Voltage	Tolerance
ECE	: Electrolytic	0J : 6.3V	C : ±0.25pF
ECCD	: Ceramic	1A : 10V	J : ±5%
ECKD	: Ceramic	1C : 16V	K : ±10%
ECQM	: Polyester	1E : 25V	Z : +80%
		1H : 50V	P : +100%
ECQP	: Polypropylene	50 : 50V	−0%
		1V : 35V	
ECG	: Ceramic	05 : 50V	M : ±20%
ECEA	□□□□N : Non Polar Electrolytic	2H : 500V	
QCU	□ : Ceramic (Chip Type)	2A : 100V	D : ±0.5pF
ECUX	: Ceramic (Chip Type)	1 : 100V	G : ±2%
ECF	: Semiconductor	KC : 400V AC	
		KC : 125VAC (UL)	
		1J : 63V	
EECW	: Liquid electrolyte double layer capcitor		

Ref. No.	Part No.	Part Code	Ref. No.	Part No.	Part Code	Ref. No.	Part No.	Part Code
C2	Δ RXAF103222EY	001 230 0547 0	C119	ECEAJU220	001 120 4670 5	C304, C305	ECFD1H104ZF	001 108 0906 2
C11, C12	ECFD1H104ZF	001 108 0906 2	C120	ECKD1H681K	001 103 1580 5	C306	ECFF1H103KR	001 108 1049 4
C13	ECEA1CU470	001 120 2835 0	C121	ECFF1H103KR	001 108 1049 4	C307	ECKD1H471KB	001 103 1551 0
C14	ECFD1H104ZF	001 108 0906 2	C122, C123	ECCD1H101KB	001 103 5369 0	C308	ECFD1H104ZF	001 108 0906 2
C15, C16	ECEA1CU221	001 120 2833 2	C124	ECKD1H222KB	001 103 1494 2	C309	ECCD1H070CC	001 103 0271 9
C17, C18	ECFD1H104ZF	001 108 0906 2	C125	ECEAJU220	001 120 4670 5	C310	ECFF1H103KR	001 108 1049 4
C19, C20	REC1A101MOT	001 120 5628 3	C126	ECEAJU470	001 120 3125 9	C311, C401	ECFD1H104ZF	001 108 0906 2
C21, C22	ECEA1CU222	001 120 3074 3	C127, C128	ECKD1H102KB	001 103 1414 8	C402	ECEAJU470	001 120 3125 9
C23, C24	ECEA1CU331	001 120 3200 5	C129	ECKD1H681K	001 103 1580 5	C403	ECFF1H103KR	001 108 1049 4
C25, C26	ECEAVU101	001 120 2929 5	C141	ECQM1H153JZ	001 106 0704 0	C404, C405	ECFD1H104ZF	001 108 0906 2
C27, C28	ECEAJUS331	001 120 2975 9	C142	ECQM1H122JZ	001 106 0683 8	C406	ECCD1H220K	001 103 0493 7
C29	REC1A101MOT	001 120 5628 3	C143	ECQM1H473JZ	001 106 0810 9	C409, C414	ECFF1H103KR	001 108 1049 4
C30	ECFD1H104ZF	001 108 0906 2	C144	ECEA1VSN2R2	001 120 5070 9	C416	ECFF1H103KR	001 108 1049 4
C31	RCBS1C103MY	001 103 8060 6	C145	ECEA1HSNR22	001 120 4836 1	C417	ECFD1H104ZF	001 108 0906 2
C32	ECFF1H103KR	001 108 1049 4	C161	ECQM1H153JZ	001 106 0704 0	C418, C419	ECCD1H101KB	001 103 5369 0
C101	ECFD1H104ZF	001 108 0906 2	C162	RCBS1H681KBY	001 103 5642 2	C420	ECEAJU101	001 120 2829 8
C102, C103	ECKD1H102KB	001 103 1414 8	C163	ECQM1H103JZ	001 106 0667 8	C501	ECEV1EV330	001 120 5624 7
C104	ECKD1H681K	001 103 1580 5	C164	ECEA1ESN3R3	001 120 5060 1	C502	ECEV1HV010	001 120 5625 6
C105, C106	ECKD1H471KB	001 103 1551 0	C165	ECEA1HSNR01	001 120 4837 0	C504	GR426B273K50	001 103 9113 6
C107	ECCD1H220K	001 103 0493 7	C181	ECQM1H474JZ	001 106 2709 7	C506	GR426B152K25	001 103 9112 7
C108	ECEA1HSOR1	001 120 3250 5	C182	RCBS1H221KBY	001 103 5603 9	C507	GR426B104Z2S	001 103 9270 4
C109	ECEA1HU010	001 120 2842 1	C183	ECQM1H682JZ	001 106 0832 3	C511, C512	ECEA1EN470S	001 120 2394 4
C110	ECQV1H104JZ	001 106 2571 7	C184	ECEA1HSN010	001 120 3237 2	C513	ECEA1EN470S	001 120 2394 4
C111, C112	ECEA1HU100	001 120 3251 4	C186	ECQM1H224JZ	001 106 0746 0	C801, C802	ECCD1H181KB	001 103 0467 9
C113	ECEA1HKNR33	001 120 3230 9	C187	ECEA1VSN2R2	001 120 5070 9	C803, C804	RBP1CN220CT	001 120 5015 6
C114	RCBS1C182MXY	001 103 8660 8	C189	RCBS1H101KBY	001 103 5569 4	C805, C806	ECKD1H102KB	001 103 1414 8
C115	RCBS1C682MXY	001 103 7092 2	C190	ECKD1H101KB	001 103 1412 0	C809, C810	ECEA1HN010	001 120 0353 1
C116	ECQM1H333JZ	001 106 0779 1	C301	ECCD1H220K	001 103 0493 7	C813, C816	ECFD1H104ZF	001 108 0906 2
C117	ECKD1H221KB	001 103 1487 1	C302	ECCD1H070CC	001 103 0271 9	C817	ECEA1HU2R2	001 120 3253 2
C118	ECEA1HU010	001 120 2842 1	C303	ECEA1VSN2R2	001 120 5070 9	C818	ECEA1VSN2R2	001 120 5070 9
						C903	ECKD1H471KB	001 103 1551 0

Ref. No.	Part No.	Part Code	Ref. No.	Part No.	Part Code	Ref. No.	Part No.	Part Code
RESISTORS								
R11, R12	ERDS2TJ681	001 152 2449 8	R153	ERDS2TJ270	001 152 2434 5	R416	ERDS2TJ913	001 152 3708 4
R13	ERDS2TJ221	001 152 2431 8	R154	ERDS2TJ3R3	001 152 3152 8	R417	ERDS2TJ124	001 152 2425 6
R14	ERDS2TJ101	001 152 2421 0	R161	ERDS2TJ333	001 152 2358 0	R418	ERDS2TJ913	001 152 3708 4
R15, R16	ERDS2TJ561	001 152 2364 2	R162	ERDS2TJ222	001 152 2353 5	R419	ERDS2TJ124	001 152 2425 6
R17	ERDS2TJ222	001 152 2353 5	R163	ERDS2TJ333	001 152 2358 0	R420	ERDS2TJ101	001 152 2421 0
R18	ERDS2TJ392	001 152 2439 0	R164	ERDS2TJ153	001 152 2351 7	R424	ERDS2TJ473	001 152 2363 3
R19	ERDS2TJ103	001 152 2347 3	R165	ERDS2TJ122	001 152 2423 8	R425, R426	ERDS2TJ103	001 152 2347 3
R20	ERDS2TJ332	001 152 2357 1	R166	ERDS2TJ102	001 152 2346 4	R427, R428	ERDS2TJ103	001 152 2347 3
R21	ERDS2TJ153	001 152 2351 7	R167	ERDS2TJ681	001 152 2449 8	R429, R430	ERDS2TJ222	001 152 2353 5
R22, R23	ERDS2TJ682	001 152 2365 1	R168	ERDS2TJ272	001 152 2354 4	R431, R432	ERDS2TJ222	001 152 2353 5
R24, R25	ERDS2TJ471	001 152 2361 5	R169	ERDS2TJ392	001 152 2439 0	R434, R436	ERDS2TJ472	001 152 2362 4
R26	ERDS2TJ471	001 152 2361 5	R170	ERDS2TJ101	001 152 2421 0	R437	ERDS2TJ472	001 152 2362 4
R27	ERDS2TJ392	001 152 2439 0	R171	ERDS2TJ270	001 152 2434 5	R438	ERDS2TJ103	001 152 2347 3
R101	ERDS2TJ154	001 152 2427 4	R172	ERDS2TJ3R3	001 152 3152 8	R439	ERDS2TJ223	001 152 2432 7
R102, R103	ERDS2TJ472	001 152 2362 4	R180	ERDS2TJ474	001 152 2443 4	R440, R442	ERDS2TJ102	001 152 2346 4
R104	ERDS2TJ223	001 152 2432 7	R181	ERDS2TJ471	001 152 2361 5	R443	ERDS2TJ102	001 152 2346 4
R105	ERDS2TJ334	001 152 2438 1	R182, R183	ERDS2TJ564	001 152 2447 0	R501, R502	ERJ8GEYK1R5	001 151 6260 8
R107	ERDS2TJ683	001 152 2450 5	R184	ERDS2TJ223	001 152 2432 7	R503	ERJ8GEYJ223	001 151 5630 6
R108	ERDS2TJ332	001 152 2357 1	R185	ERDS2TJ433	001 152 2575 3	R801, R802	ERDS2TJ222	001 152 2353 5
R109	ERDS2TJ822	001 152 2455 0	R186, R187	ERDS2TKF4702	001 151 5723 2	R803, R804	ERDS2TJ272	001 152 2354 4
R110, R111	ERDS2TJ682	001 152 2365 1	R188	ERDS2TKF4702	001 151 5723 2	R805, R806	ERDS2TJ221	001 152 2431 8
R112	ERDS2TJ822	001 152 2455 0	R189, R190	ERDS2TJ123	001 152 2424 7	R807, R808	ERDS2TJ391	001 152 2360 6
R113, R114	ERDS2TJ182	001 152 2352 6	R191	ERDS2TJ154	001 152 2427 4	R809, R810	ERDS2TJ473	001 152 2363 3
R115	ERDS2TJ102	001 152 2346 4	R192	ERDS2TJ824	001 152 2457 8	R811, R812	ERDS2TJ124	001 152 2425 6
R116, R117	ERDS2TJ182	001 152 2352 6	R193	ERDS2TJ101	001 152 2421 0	R813, R814	ERDS2TJ223	001 152 2432 7
R118	ERDS2TJ102	001 152 2346 4	R194	ERDS2TJ683	001 152 2450 5	R815, R816	ERDS2TJ273	001 152 2436 3
R119	ERDS2TJ471	001 152 2361 5	R195, R196	ERDS2TJ103	001 152 2347 3	R817, R818	ERDS2TJ124	001 152 2425 6
R120	ERDS2TJ120	001 152 3146 6	R197	ERDS2TJ473	001 152 2363 3	R819, R820	ERDS2TJ560	001 152 2597 7
R122	ERDS2TJ471	001 152 2361 5	R198	ERDS2TJ393	001 152 2440 7	R821, R822	ERDS2TJ472	001 152 2362 4
R141	ERDS2TJ102	001 152 2346 4	R301	ERDS2TJ102	001 152 2346 4	R823	ERDS2TJ104	001 152 2348 2
R142	ERDS2TJ333	001 152 2358 0	R302	ERDS2TJ472	001 152 2362 4	R825, R826	ERDS2TJ102	001 152 2346 4
R143	ERDS2TJ224	001 152 2433 6	R305	ERDS2TJ104	001 152 2348 2	R827	ERDS2TJ103	001 152 2347 3
R144	ERDS2TJ333	001 152 2358 0	R307	ERDS2TJ471	001 152 2361 5	R828, R829	ERDS2TJ102	001 152 2346 4
R145	ERDS2TJ153	001 152 2351 7	R308	ERDS2TJ121	001 152 2349 1	R831, R832	ERDS2TJ100	001 152 2420 1
R146	ERDS2TJ122	001 152 2423 8	R309	ERDS2TJ472	001 152 2362 4	R833, R834	ERDS2TJ330	001 152 2355 3
R147	ERDS2TJ682	001 152 2365 1	R401, R402	ERDS2TJ223	001 152 2432 7	R835, R836	ERDS2TJ102	001 152 2346 4
R148	ERDS2TJ104	001 152 2348 2	R403	ERDS2TJ472	001 152 2362 4	R837, R838	ERDS2TJ332	001 152 2357 1
R149	ERDS2TJ152	001 152 2350 8	R404, R406	ERDS2TJ394	001 152 2441 6	R839, R840	ERDS2TJ332	001 152 2357 1
R150	ERDS2TJ103	001 152 2347 3	R407	ERDS2TJ152	001 152 2350 8	R843	ERDS2TJ473	001 152 2363 3
R151	ERDS2TJ101	001 152 2421 0	R409, R410	ERDS2TJ472	001 152 2362 4	R845	ERD25FJ102	001 152 0215 2
R152	ERDS2TJ153	001 152 2351 7	R411, R412	ERDS2TJ472	001 152 2362 4	CAPACITORS		
			R413, R414	ERDS2TJ472	001 152 2362 4	C1	Δ ECKDKC103PF2	001 103 3734 7
			R415	ERDS2TJ472	001 152 2362 4			

REPLACEMENT PARTS LIST

Notes: * Important safety notice:

Components identified by Δ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

* Bracketed indications in Ref. No. columns specify the area.

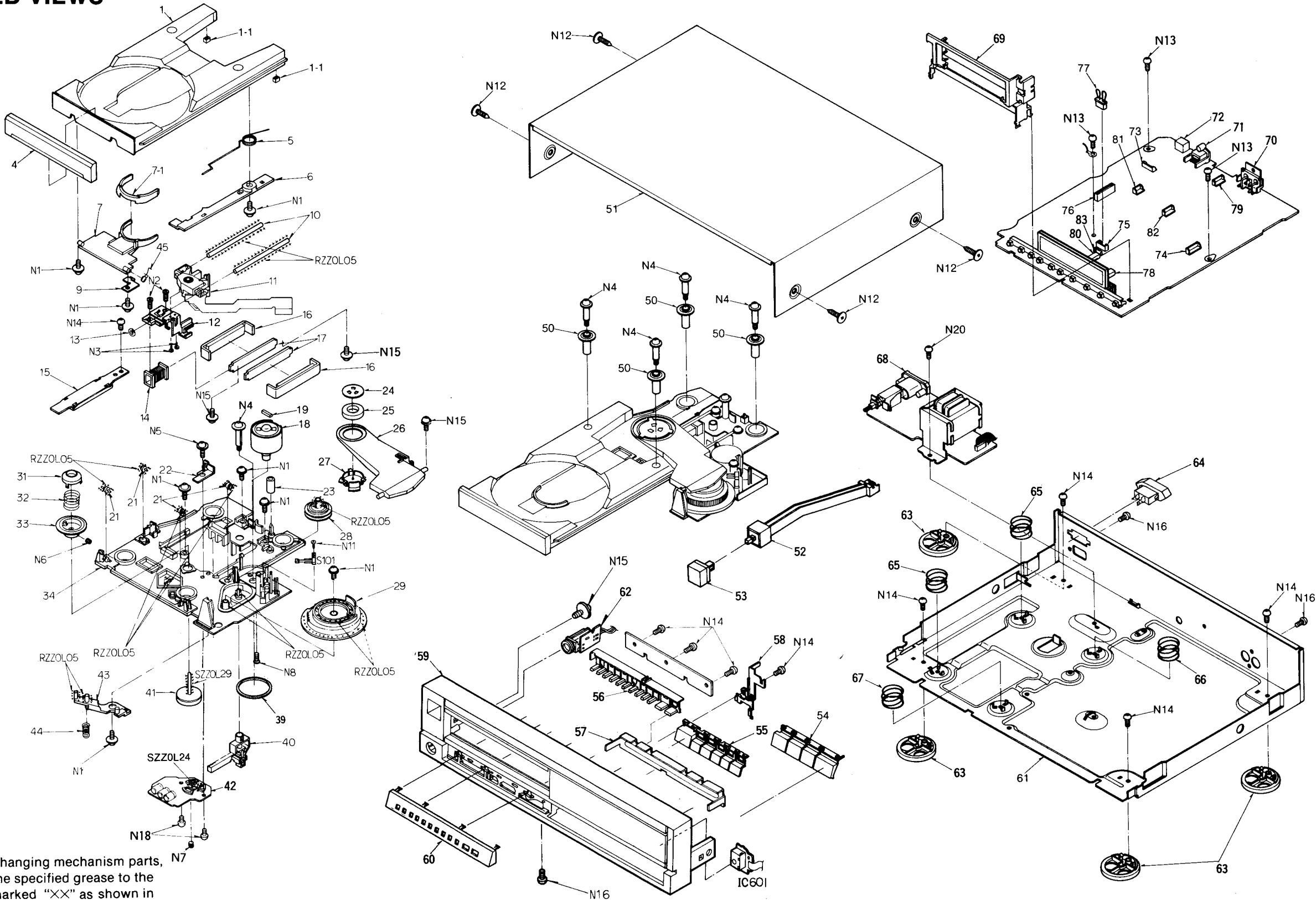
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Code	Description	Ref. No.	Part No.	Part Code	Description
INTEGRATED CIRCUITS				D181, D182	MA165	001 032 0494 0	D1ODE
IC1, IC2 Δ	SV1FU38	001 061 3400 7	I.C.PROTECTOR	D401- D410	MA165	001 032 0494 0	D1ODE
(EK, XA, XB)				D412, D413	MA165	001 032 0494 0	D1ODE
(PA, PE, PC)				D415- D418	MA165	001 032 0494 0	D1ODE
IC11, IC12	SV1FU15	001 060 8433 3	I.C.PROTECTOR	D501	MA153	001 032 0489 7	D1ODE
IC13	MS26L	001 060 5358 9	I.C., REGULATOR	D801- D803	MA165	001 032 0494 0	D1ODE
IC101	AN8370S	001 060 8399 8	I.C., SERVO	I.C.PROTECTORS			
IC102	MN636S	001 061 3044 7	I.C., ANALOG SW.	FP11	SRUDPF06F6	016 712 0339 4	I.C.PROTECTOR
IC103, IC104	AN6554NS	001 060 4860 4	I.C., OPERATION AMP.	(EK, XA, XB)			
IC105	SV1FU10	001 060 8432 4	I.C.PROTECTOR	(PA, PE, PC)			
(EK, XA, XB)				FP12	SRUDPT08F6	016 712 0338 5	I.C.PROTECTOR
(PA, PE, PC)				(EK, XA, XB)			
IC301	MN6617	001 060 8411 9	I.C., SIGNAL PROCESSING	(PA, PE, PC)			
IC302	MN6618A	001 061 3043 8	I.C., DIGITAL FILTER	HALL ELEMENTS			
IC303	SV1CXK5816M	001 061 3298 7	I.C., 16K RAM	H501, H502	0H-001	001 036 0010 2	HALL ELEMENT
IC304	EHDGA1243	001 061 3036 7	I.C., PLL	VARIABLE RESISTORS			
IC401	MN15283PDQ	001 061 4788 0	I.C., SYSTEM CONTROL	VR101	EVND3AA00B53	001 180 2644 9	V.R., 5K Ω (B)
IC402	SV1MS218FP	001 061 5321 7	I.C., OPERATION AMP.	VR102, VR103	EVND3AA00B14	001 180 2642 1	V.R., 10K Ω (B)
IC403	MN1280-R	001 060 8669 5	I.C., RESET	VR104, VR105	EVND3AA00B14	001 180 2642 1	V.R., 10K Ω (B)
IC404	MN1550PDT	001 061 3639 6	I.C., MICRO COMPUTER	VR106	EVND3AA00B53	001 180 2644 9	V.R., 5K Ω (B)
IC501	AN8290S	001 061 3034 9	I.C., SPINDLE DRIVE	VR301	EVN38CA00B13	001 180 0549 5	V.R., 1K Ω (B)
IC602	SV1HCM001E	001 061 5320 8	I.C., REMOTE RECEIVER	COILS AND TRANSFORMERS			
IC801	SV1PCMS4HP-1	001 061 3098 3	I.C., D/A CONVERTER	L1, L2 Δ	SLQX400-D	001 210 7020 0	COIL
IC802	SV1UPDA053G1	001 060 8804 6	I.C., ANALOG SW.	L301, L302	ELEV101KA	001 211 0608 1	COIL
IC803	SV1MS238FP	001 061 5284 5	I.C., OPERATION AMP.	L401	ELEV101KA	001 211 0608 1	COIL
IC804	SV1NJMS532M	001 061 4775 5	I.C., OPERATION AMP.	L403, L404	ELEV3R3KA	001 211 4255 0	COIL
IC805	AN6558S	001 060 9056 4	I.C., OPERATION AMP.	L501	NL4532T100K2	001 211 3218 9	COIL
IC806	MN1280-S	001 061 3084 9	I.C., MUTING	L801, L802	ELEV3R3KA	001 211 4255 0	COIL
IC807	SV1MS238FP	001 061 5284 5	I.C., OPERATION AMP.	L901- L903	ELEV3R3KA	001 211 4255 0	COIL
IC809, IC810	SV1GA011	001 061 3045 6	I.C., FILTER	T1 Δ	SLTD5K028SE	001 202 8859 3	POWER TRANSFORMER
TRANSISTORS				(E, EG, EB, EH)			
Q11	2SD1862QR	001 030 7210 8	TRANSISTOR	(EF, E1)			
Q12, Q13	2SB1240QR	001 030 7208 2	TRANSISTOR	T1 Δ	SLTD5K029SG	001 202 8860 0	POWER TRANSFORMER
Q14	2SB1240QR	001 030 7208 2	TRANSISTOR	(EK, XL)			
Q15	2SD1862QR	001 030 7210 8	TRANSISTOR	T1 Δ	SLTD5K030SX	001 202 8861 9	POWER TRANSFORMER
Q16	2SB1240QR	001 030 7208 2	TRANSISTOR	(XA, XB, PA)			
Q17	2SA154QR	001 030 7422 8	TRANSISTOR	(PE, PC)			
Q101	2SC4010Q	001 030 7233 1	TRANSISTOR	OSCILLATORS			
Q141	2SD1862QR	001 030 7210 8	TRANSISTOR	X301	SVQ16CKSS	001 250 1471 7	16.9344MHZ
Q142	2SB1240QR	001 030 7208 2	TRANSISTOR	DISPLAYS			
Q161	2SD1862QR	001 030 7210 8	TRANSISTOR	FL401	SADD7	001 001 0505 7	DISPLAY
Q162	2SB1240QR	001 030 7208 2	TRANSISTOR	FUSES			
Q181	2SD1862QR	001 030 7210 8	TRANSISTOR	F1 Δ	XBA2C012TB0	002 380 1370 8	250V, T125mA
Q182	2SB1240QR	001 030 7208 2	TRANSISTOR	(E, EK, XL, EG)			
Q402	2SD1862QR	001 030 7210 8	TRANSISTOR	(EB, EH, EF)			
Q403	2SB1240QR	001 030 7208 2	TRANSISTOR	(E1)			
Q405, Q406	UN4212	001 030 3019 1	TRANSISTOR	F1 Δ	XBA2C025TB0	002 380 1458 1	250V, T250mA
Q410- Q418	UN4212	001 030 3019 1	TRANSISTOR	(XA, XB, PA)			
Q419	UN4112	001 030 3018 2	TRANSISTOR	(PE, PC)			
Q801	UN4212	001 030 3019 1	TRANSISTOR	F2 Δ	XBA2C08TB0	002 380 1460 7	250V, T800mA
Q802	UN4113	001 030 2900 9	TRANSISTOR	(E, EG, EB, EH)			
Q803, Q804	2SC3311A-Q	001 030 5279 5	TRANSISTOR	(EF, E1)			
Q805	2SC3311A-Q	001 030 5279 5	TRANSISTOR	SWITCHES			
Q806	UN4112	001 030 3018 2	TRANSISTOR	S1 Δ	ES88249V	003 435 5877 0	POWER SW
Q807, Q808	2SD1450RS	001 030 6115 0	TRANSISTOR	S2 Δ	SSR187-1	003 430 2201 5	SW, VOLTAGE SELECT
Q809	UN4112	001 030 3018 2	TRANSISTOR	(XA, XB, PA)			
Q810	UN4212	001 030 3019 1	TRANSISTOR	(PE, PC)			
DIODES				S401- S410	SSGD5	003 437 0982 0	SW, OPERATION
D11, D12	MA4091-M	001 032 7213 5	D1ODE	S411- S422	EVQQA405K	003 435 2832 5	SW, PROGRAM
D15, D16	MA4068H	001 032 4952 9	D1ODE	RELAYS			
D17	MA4330M	001 032 4967 2	D1ODE	RL801	SSYD2	003 450 2734 9	RELAY
D18	MA4056-M	001 032 7209 1	D1ODE				
D19- D26 Δ	SVD1SR35200A	001 032 3951 4	RECTIFIER				

Ref. No.	Part No.	Part Code	Description	Ref. No.	Part No.	Part Code	Description
LOADING MECHANICAL				21	SDRD2	016 740 0117 8	ROLLER
1	S1RLX880-KN	016 652 0774 2	DISC TRAY ASS'Y	22	SUWD44	016 650 5250 5	BRACKET
1-1	SHGD49	016 653 1079 9	RUBBER CUSHION	23	SHGD69	016 653 1078 0	RUBBER
4	SGXD3020ZK0A	016 846 3724 2	ORNAMENT PLATE	24	SOYD2	016 634 0111 7	YOKE
5	SUSD29-1	016 726 0845 5	SPRING	25	SOMD4	003 453 0241 8	MAGNET
6	SIRD20	016 718 3355 2	LEVER	26	SIRD17E	016 645 0165 2	CLAMPER
7	SIRD16E	016 631 0042 8	HOLDER ASS'Y	27	SIRD28	016 631 0053 5	HOLDER
7-1	SHGD46	016 653 1080 6	RUBBER CUSHION	28	SDGD19	016 745 0199 5	GEAR
9	SUWD46	016 650 5256 9	BRACKET	29	SDGD20-1	016 745 0202 7	GEAR
10	SUXD25	016 634 0124 2	SHAFT	31	SD008	005 512 0399 3	RING
11 Δ	SOALP1200-KM	001 271 0692 3	OPTICAL PICKUP ASS'Y	32	SRQA010N04	017 726 0412 8	SPRING
12	EWSL04A00000	016 631 0044 6	HOLDER	33	SD007-1	016 766 0190 7	TURNABLE ASS'Y
13	SHGD131	016 653 1216 8	STOPPER	34	S1SD7E	016 827 0313 6	BASE
14	SORD10E	001 211 3219 8	COIL	39	SMBD2-1	016 754 0059 5	BELT
15	EWS7B0A00Q53	001 174 8773 3	RESISTANCE UNIT	40	SHRD23	016 652 0633 4	LOCK SHAFT
16	SOYD8E	016 634 0128 8	YOKE	41	SOMD9A	016 743 0060 3	ROTOR
17	SOYD9	016 634 0125 1	YOKE	42	SXPD1440	003 483 3040 5	SPINDLE P.C.B.
18	SJGD8E	002 310 2569 3	MOTOR, LOADING	43	SHRD19	016 652 0634 3	LEVER
19	SHGD116	016 653 1188 5	RUBBER CUSHION	44	SUSD31	016 726 0843 7	SPRING
				45	SUSD51	016 726 0846 4	SPRING

Ref. No.	Part No.	Part Code	Description	Ref. No.	Part No.	Part Code	Description
CABINET AND CHASSIS				68 Δ	SJS9236	003 403 4660 7	AC SOCKET
50	SHGD95-1	016 653 1136 7	RUBBER CUSHION	(E, EK, EG, EB)			
51	SKCD570KY0A	016 800 3041 6	CABINET	(EH, EF, E1)			
52	SUBD7	016 712 0353 6	ROD	(XA, XB, PA)			
53	SBC666-1	016 702 6076 0	BUTTON	(PE, PC)			
54	SBCD430ZKJA	016 702 6938 9	BUTTON	69	SMND11	016 632 1863 0	BRACKET
55	SBCD440ZK0A	016 702 6937 0	BUTTON	70	SJFD4	003 410 7707 6	OUTPUT TERMINAL
56	SBCD450ZK	016 702 6936 1	BUTTON	71	SJS402	003 403 7103 9	CONNECTOR, TAPE
57	SUWD68	016 650 5414 3	BRACKET	72	SJJ130-3	003 400 7580 9	JACK, SYNCHRO
58	SHRD73	016 652 0765 3	HOLDER	73	EMCS0650Z	003 402 1235 7	CONNECTOR (CN11)
59	SGYLPJ44-KE	016 840 7684 7	FRONT PANEL	74	EMCS0750Z	003 402 1238 4	CONNECTOR (CN401)
60	SGXD3000ZK0A	016 846 3725 1	ORNAMENT PANEL	75	EMCS0552M	003 402 0112 1	CONNECTOR (CN102)
61	SGPD650ZF10A	016 840 7974 0	CHASSIS	76	SJSD1709	003 403 6503 1	CONNECTOR (CN101)
(XL)				77	SRDJ001N14E	003 410 6157 8	SHORTING PIN (CN102)
61	SGPD650ZF13A	016 840 7975 9	CHASSIS	78	SJSD0405	003 403 7005 0	CONNECTOR (CN406)
(XB)				79	EMCS0350Z	003 402 1227 7	CONNECTOR (CN103)
61	SGPD650ZF2A	016 840 7736 2	CHASSIS	80	SJSD0405	003 403 7005 0	CONNECTOR (CN407)
(E)				81	EMCS0350Z	003 402 1227 7	CONNECTOR (CN801)
61	SGPD650ZF4A	016 840 7922 2	CHASSIS	82	EMCS0550Z	003 402 1233 9	CONNECTOR (CN402)
(XA)				83	SJSD0305	003 403 7004 1	CONNECTOR (CN403)
61	SGPD650ZF6A	016 840 7735 3	CHASSIS	SCREWS, WASHERS & NUTS			
(EK)				N1	SNSD10	005 500 5675 8	SCREW
61	SGPLPJ44-KEB	016 840 7698 1	CHASSIS	N2	XTN2+4G	005 501 2780 5	SCREW
(EB, EH, EF)				N3	XQN17+A6	005 500 4900 2	SCREW
(E1)				N4	SHDD1-5	016 652 0759 1	SCREW
61	SGPLPJ44-KEG	016 840 7699 0	CHASSIS	N5	XTW3+8T	005 501 1358 9	SCREW
(EG)				N6	XXE26D5	005 500 5095 2	SCREW
61	SGPLPJ44-KPA	016 840 7697 2	CHASSIS	N7	SNSD9	016 726 0765 4	SCREW
(PA, PE, PC)				N8	XSN26+6	005 500 1364 6	SCREW
62	SJJ134B	003 400 7050 0	JACK, HEADPHONES	N9	SFXW120-01	005 513 0957 0	WASHER
63	SKL307	016 828 0325 7	FOOT	N10	XSN26+8	005 500 1368 2	SCREW
64 Δ	SJS9225	003 400 3946 5	AC OUTLET	N11	XTN2+5G	005 501 3534 3	SCREW
(E, EG, EB, EH)				N12	SNE2129-1	005 500 7938 6	SCREW
(EF, E1, XA)				N13	XTV3+6JFYR	005 501 2611 1	SCREW
(PA, PE, PC)				N14	XTV3+8G	005 501 0913 8	SCREW
64 Δ	SJS9227	003 400 3948 3	AC OUTLET	N15	SFXGQ06N01	005 500 4983 3	SCREW
(EK)				N16	XTV3+8JFZ	005 501 0919 2	SCREW
65	SUSD65	016 726 0903 2	SPRING (YELLOW)	N18	XTV3+14G	005 501 0851 5	SCREW
66	SUSD42	016 726 0841 9	SPRING (SILVER)	N19	XTV3+68FN	005 501 0888 2	SCREW
67	SUSD66	016 726 0904 1	SPRING (BLUE)	N20	XTV3+6GFZ	005 501 3160 3	SCREW
68 Δ	SJSD16	003 400 7436 6	AC SOCKET				
(XL)							

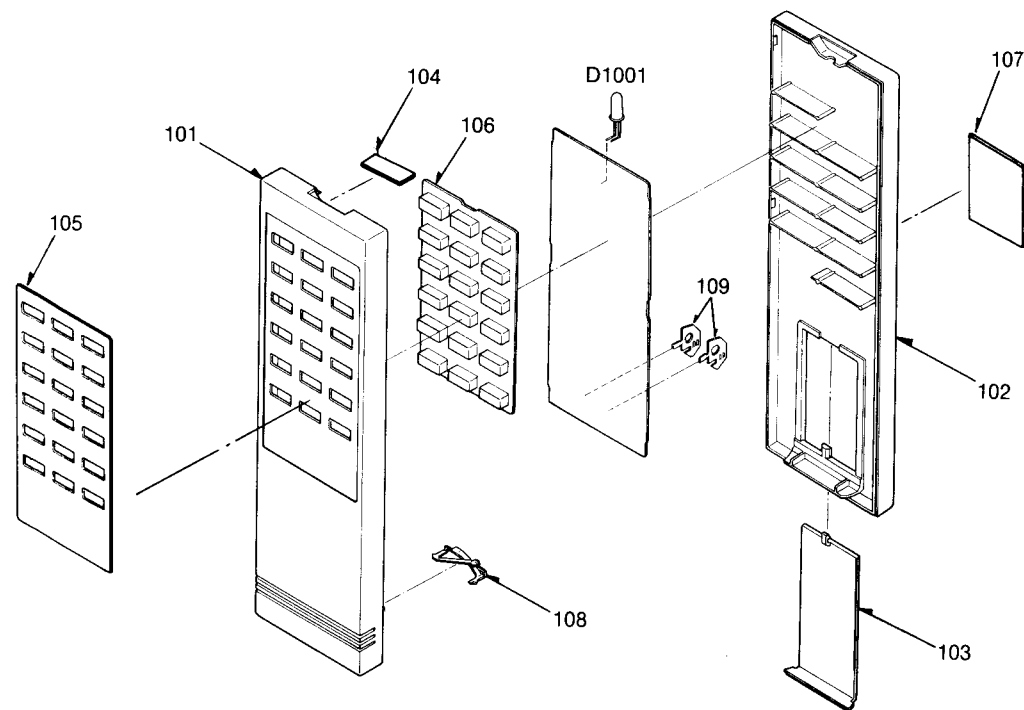
■ EXPLODED VIEWS



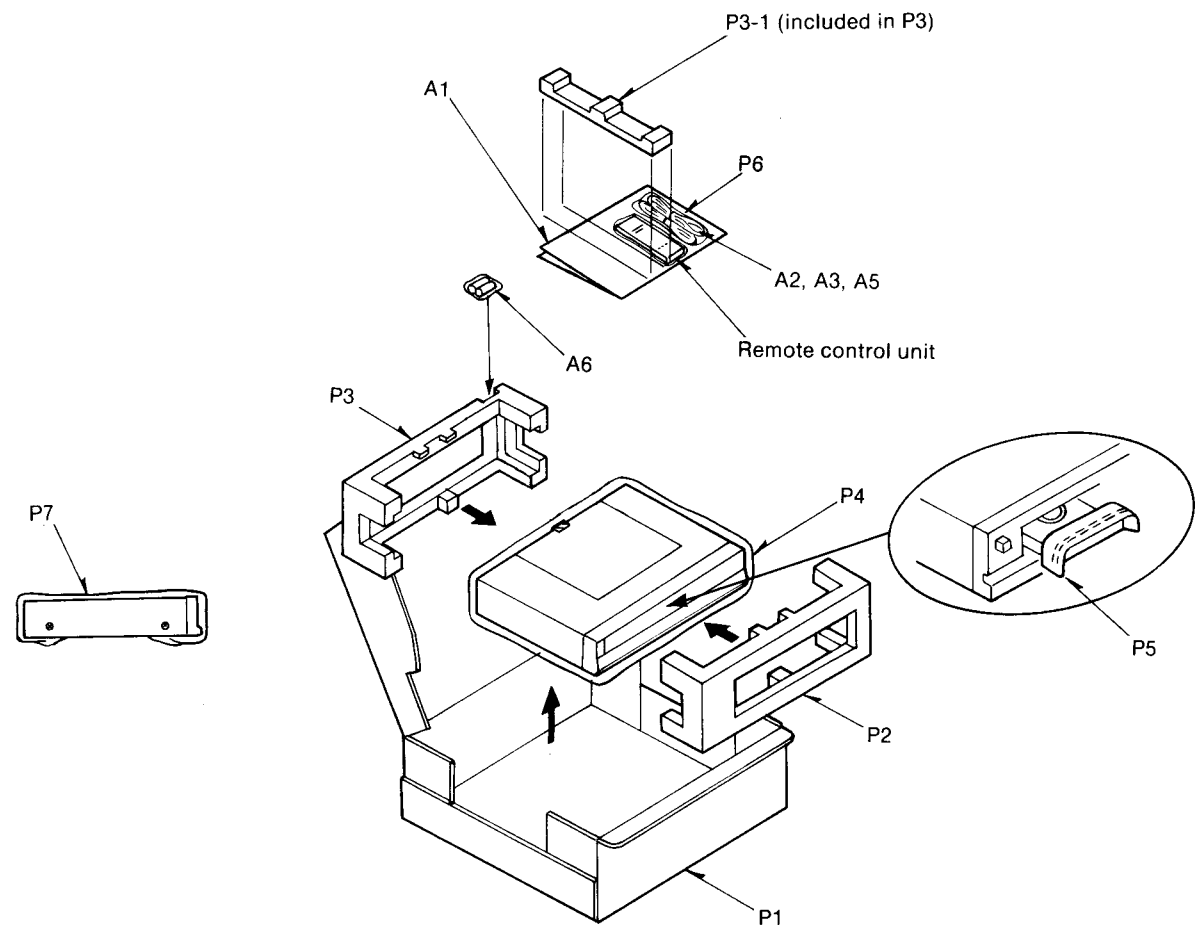
Note: When changing mechanism parts, apply the specified grease to the areas marked “XX” as shown in the drawing.

1 ~ 30	4 N1 N5 N6	9 N1 N13	7 N3 N1	18 N7 N1	7-1 N2 N22	1-1 N4	11 N1 N8	5 N1 N18	19 N1 N16	1-1 N6	10 N7 N23	16 N1 N11	24 N25	26 N26	N15	N12	N4 N15	N4 N4	N14 N4	N14	N12 N14	N12 N20	N13 N14	N13 N16 N14	N13	N14 N16						
31 ~ 60	31 32 33	34 44	43	45 41	42	39 40	59	60	50	57	56	51 50	50	50	50	53	55	58	52	54												
61 ~ 82									62							67	68	65	63				69	65	76 83 80	81 75	73 78	82	72 64 66	62 62 63	71 79	70

• Remote control unit parts



■ PACKING



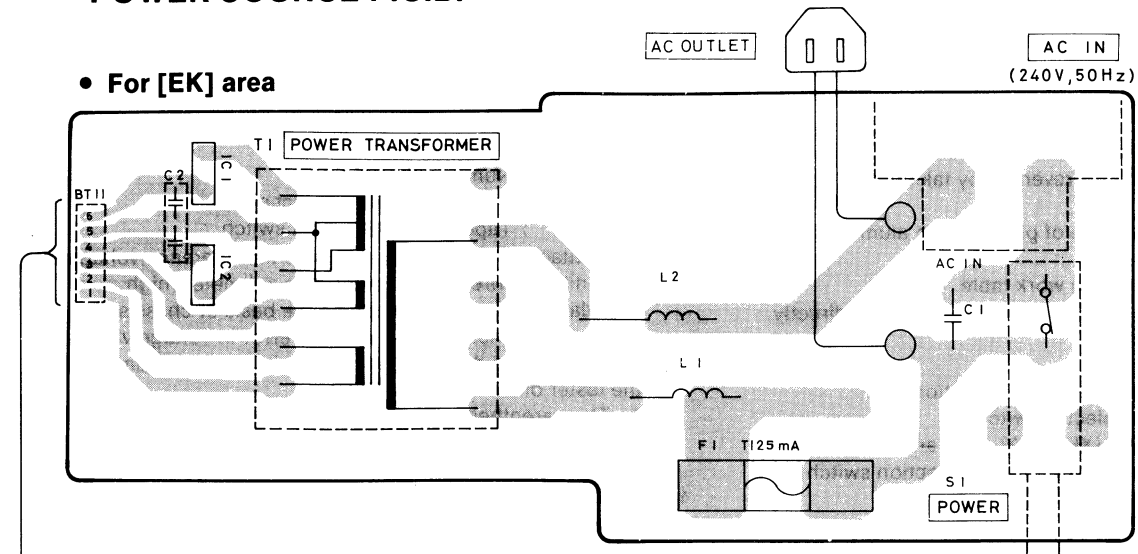
■ REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Code	Description	Ref. No.	Part No.	Part Code	Description
I.C. (REMOTE CONTROL)				CAPACITORS (REMOTE CONTROL)			
C1001	MN6030B	001 060 6133 0	I.C., TRANSMITTER	C1001	ECKD1H471KB	001 103 1551 0	CERAMIC, 50V, 470PF
TRANSISTORS (REMOTE CONTROL)				C1002	ECKD1H121KB	001 103 1455 9	CERAMIC, 50V, 120PF
Q1001	UN1231	001 030 5092 4	TRANSISTOR	C1003	ECEA0JK101	001 120 0136 8	ELECTROLYTIC, 6.3V, 100µF
DIODES (REMOTE CONTROL)				REMOTE CONTROL TRANSMITTER			
D1001	LN66-S	001 032 3730 5	L.E.D	101	UR64CS262G	016 800 3156 6	CABINET
D1002, D1003	MA154WK	001 032 3491 1	DIODE	102	UR64CS263	016 802 2168 6	BOTTOM COVER
D1004, D1005	MA154WK	001 032 3491 1	DIODE	103	UR64EC264	016 820 0595 7	BATTERY COVER
D1006, D1007	MA154WA	001 032 3490 2	DIODE	104	UR52SB327	016 842 1591 5	FILTER
OSCILLATOR (REMOTE CONTROL)				105	UR64PP265F	016 840 7982 0	FRONT PANEL
X1001	CSB420PB1	001 030 0013 9	420 KHZ	106	UR64CT266G	016 653 1187 6	BUTTON
RESISTORS (REMOTE CONTROL)				107	UR64LB126CC	016 862 1129 1	LABEL
R1001	ERDS2TJ1R0	001 152 2419 4	CARBON, 1Ω, 1/4W	108	UR52TD101	003 413 1406 5	TERMINAL (COMMON)
				109	UR50TD460	003 410 8068 0	BATTERY TERMINAL

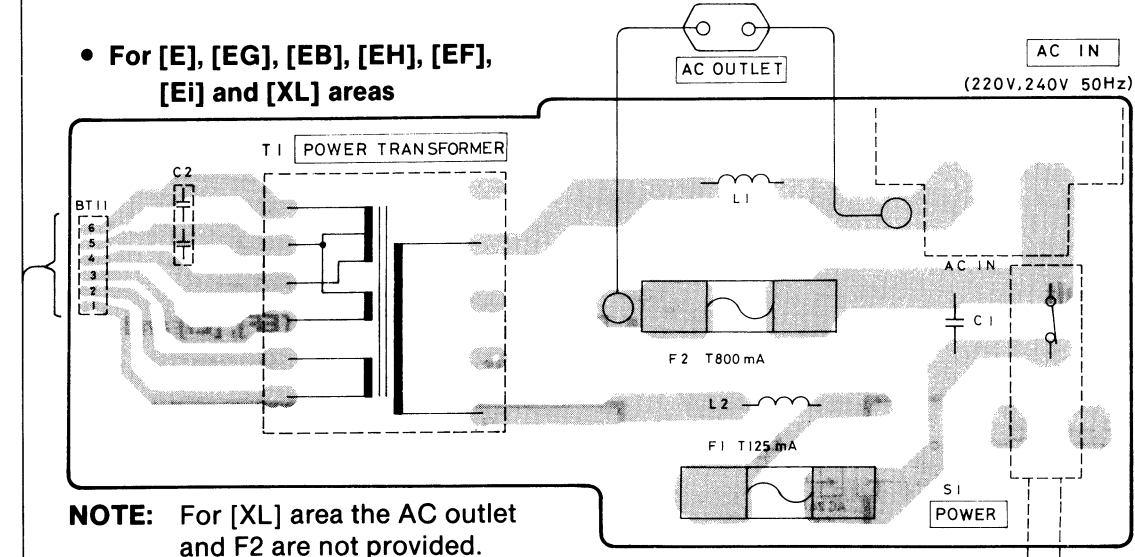
Ref. No.	Part No.	Part Code	Description	Ref. No.	Part No.	Part Code	Description
PACKINGS							
P1 (E, EK, XL, EG) (EB, EH, E1) (XA, XB, PA) (PE, PC)	SPND179	016 971 5049 6	CARTON BOX	A1 (E, EB, EH) A1 (PA, PE, PC) A1 (XB) A2 △ (E, EG, EB, EH) (EF, E1) A2 △ (XA, PA, PE) (PC) A2 △ (XL) A2 △ (XB) A2 △ (EK) A3 A4 △ (XA, XB, PA) (PE, PC) A5 A6	SQULPJ44-KE	016 983 5324 0	INSTRUCTION MANUAL
P1 (EF)	SPND180	016 971 5115 3	CARTON BOX	A1 (PA, PE, PC)	SQULPJ44-KPA	016 983 5321 3	INSTRUCTION MANUAL
P2	SPSD120	016 977 3346 8	PAD	A1 (XB)	SQULPJ44-KXB	016 983 5320 4	INSTRUCTION MANUAL
P3	SPSD121	016 977 3345 9	PAD	A2 △ (E, EG, EB, EH) (EF, E1)	SFDAC05E03	003 490 4809 5	POWER CORD
P4	XZB50X50A01	016 978 0524 5	PROTECTION COVER	A2 △ (XA, PA, PE) (PC)	SJA168-1	003 490 4122 9	POWER CORD
P5	SPSD68	016 977 3081 4	SHEET	A2 △ (XL)	SJA173	003 490 4161 2	POWER CORD
P6	XZB23X20C03	016 978 0480 0	POLYETHYLENE BAG	A2 △ (XB)	SJA183	003 490 4873 7	POWER CORD
P7	SPSD101	016 977 3232 7	SHEET	A2 △ (EK)	SJA188	003 490 5443 1	POWER CORD
ACCESSORIES				A3	SJP2249-1	003 492 6446 4	OUTPUT CORD
A1 (XL, XA)	SQUD172	016 983 5179 1	INSTRUCTION MANUAL	A4 △ (XA, XB, PA) (PE, PC)	SJP9215	003 402 1437 9	AC PLUG ADAPTOR
A1 (EK)	SQUD173	016 983 5177 3	INSTRUCTION MANUAL	A5	SJP2257	003 492 4915 4	CORD, SYNCHRO-REC
A1 (E1)	SQUD174	016 983 5323 1	INSTRUCTION MANUAL	A6	UM-3NE		BATTERY
A1 (EG)	SQUD230	016 983 5289 6	INSTRUCTION MANUAL				
A1 (EF)	SQUD231	016 983 5322 2	INSTRUCTION MANUAL				

■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

• **POWER SOURCE P.C.B.**

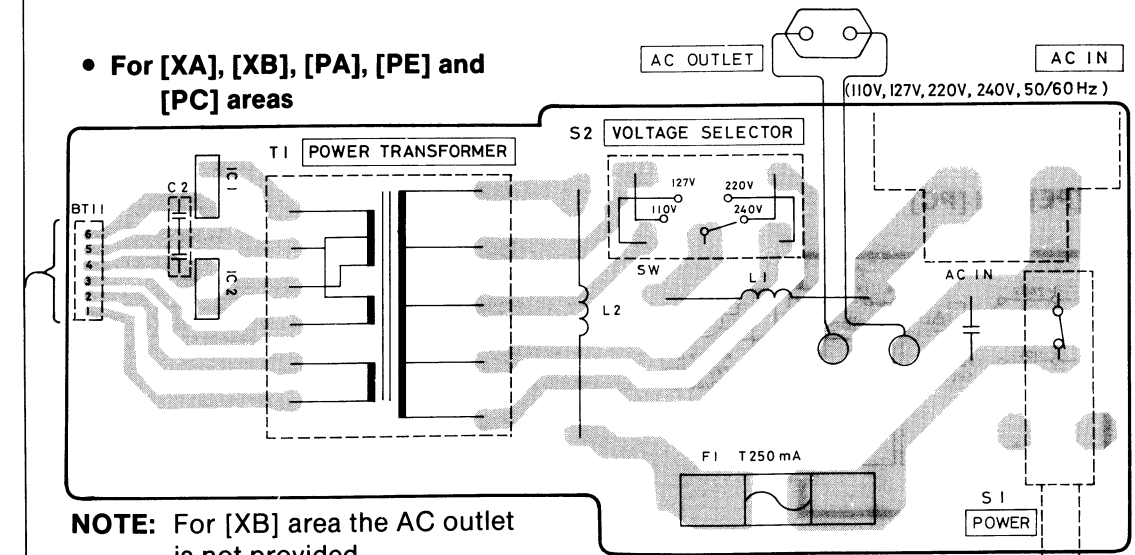


- For [E], [EG], [EB], [EH], [EF], [Ei] and [XL] areas



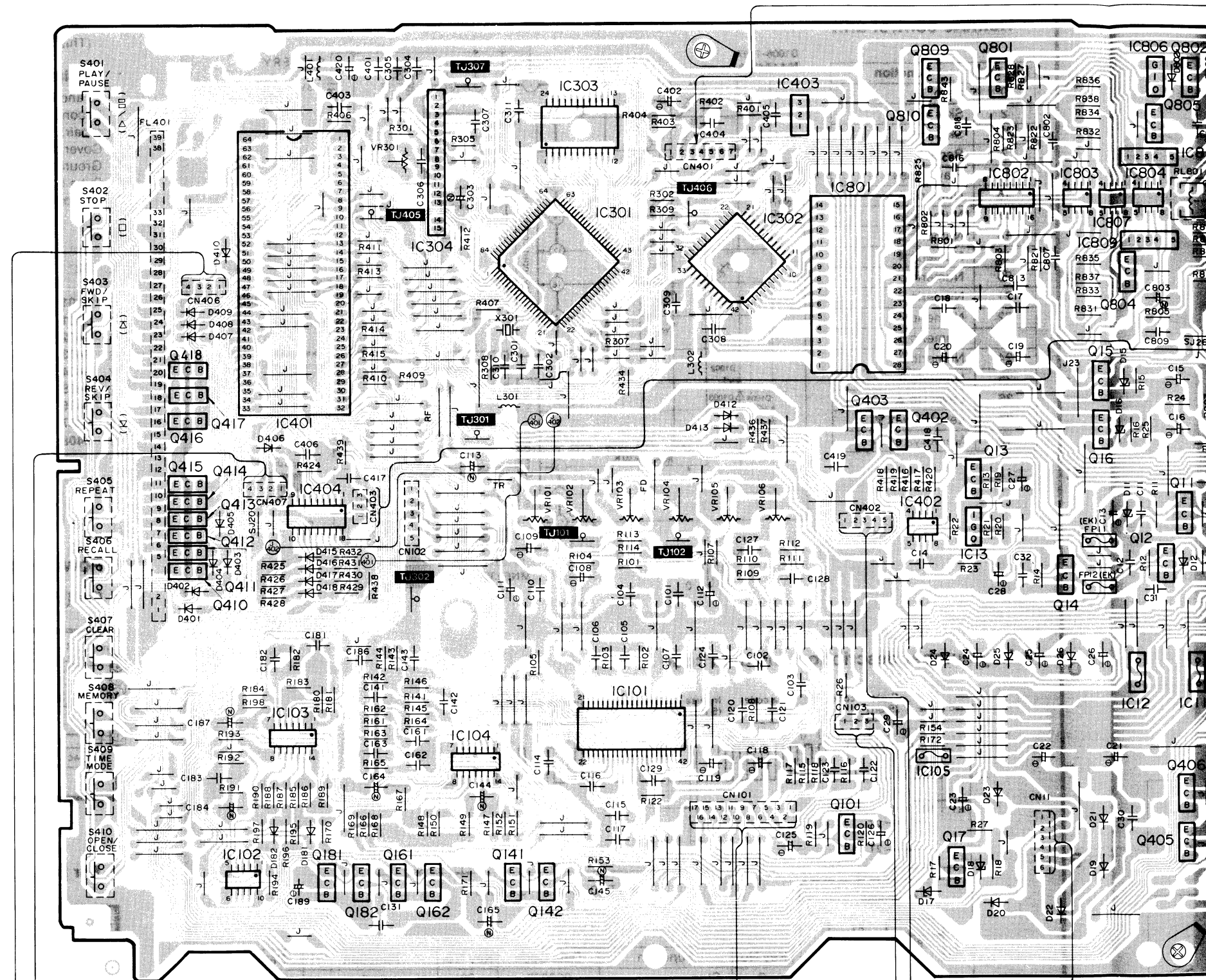
NOTE: For [XL] area the AC outlet and F2 are not provided.

- For [XA], [XB], [PA], [PE] and [PC] areas

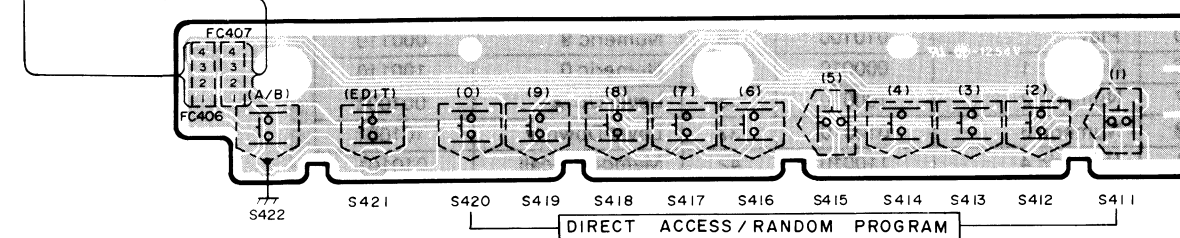


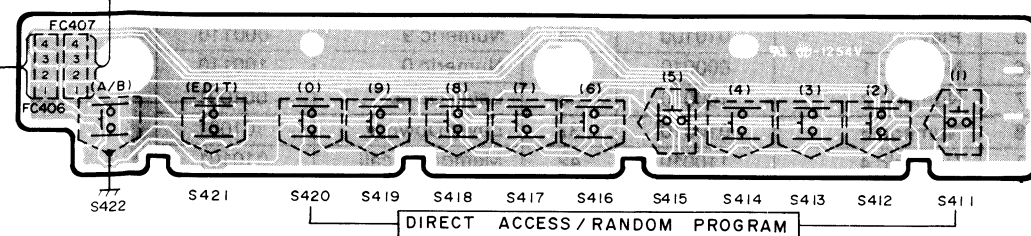
NOTE: For [XB] area the AC outlet is not provided.

- **MAIN P.C.B.**

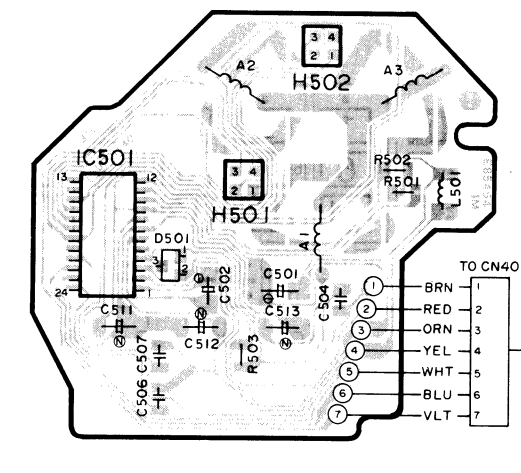


- OPERATION P.C.B.

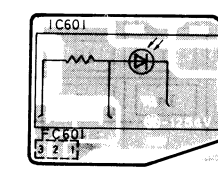




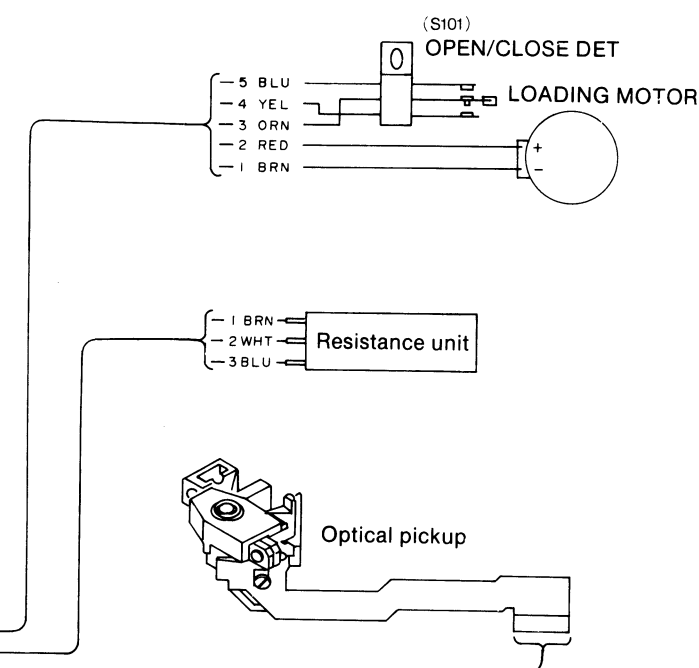
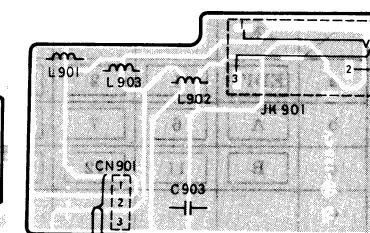
- **SPINDLE CONTROL P.C.B.**



- **REMOTE SENSOR P.C.B.**

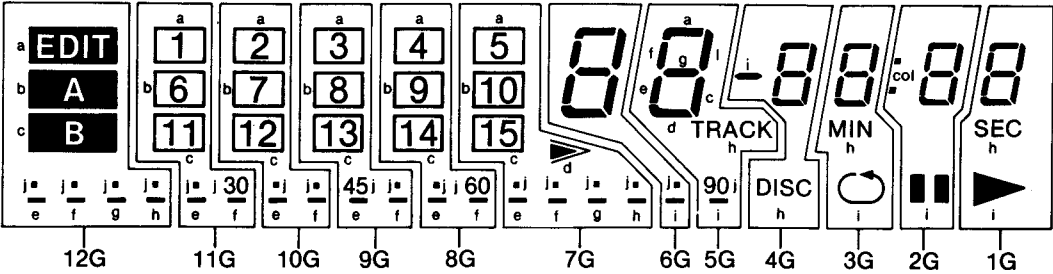


- **HEADPHONE P.C.B.**



INTERNAL CONNECTION OF FL401

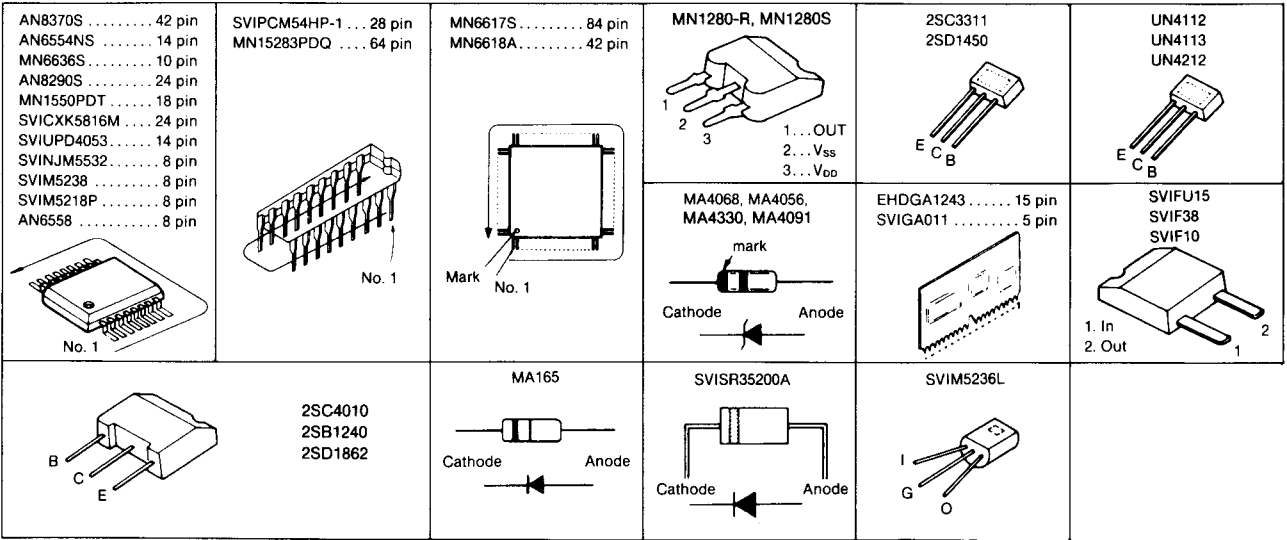
Grid connection diagram



Anode connection table

	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	EDIT	1	2	3	4	5	a	a	a	a	a	a
b	A	6	7	8	9	10	b	b	b	b	b	b
c	B	11	12	13	14	15	c	c	c	c	c	c
d	-	-	-	-	-	▶	d	d	d	d	d	d
e	-	-	-	-	-	-	e	e	e	e	e	e
f	-	-	-	-	-	-	f	f	f	f	f	f
g	-	-	-	-	-	-	g	g	g	g	g	g
h	-	-	-	-	-	-	-	TRACK	DISC	MIN	col	SEC
i	-	-	-	-	-	-	-	-	▶	▶	▶	▶
j	■ ■ ■ ■	■ 30	■ ■	45 ■	■ 60	■ ■ ■ ■	■	90	-	-	-	-

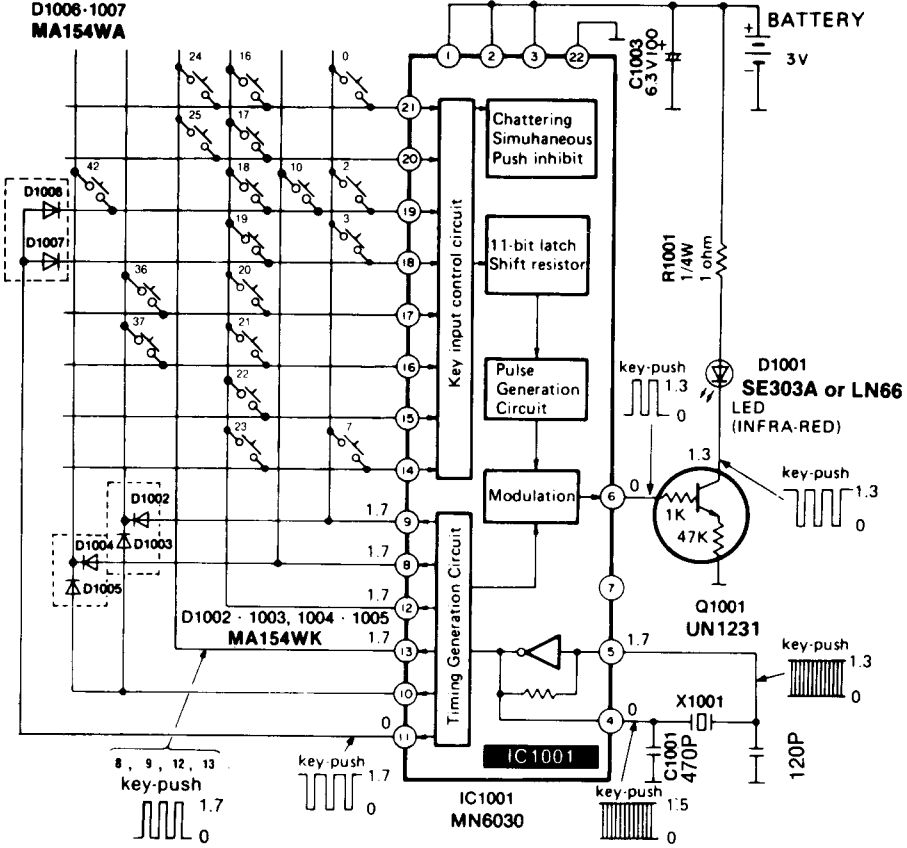
TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES



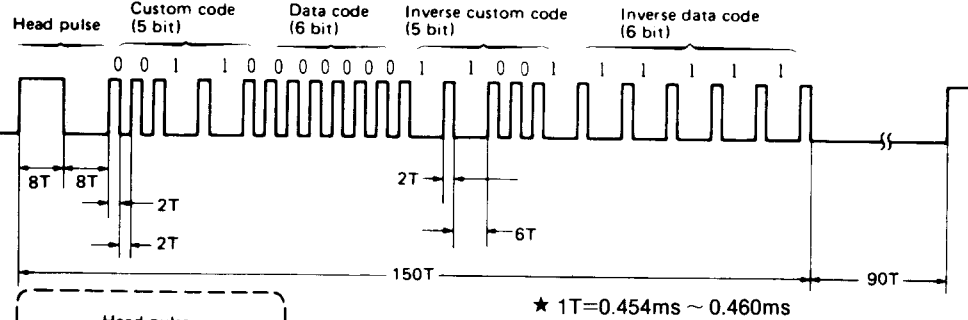
SCHEMATIC DIAGRAM

Remote control unit

Key No.	Function
0	Stop
2	Skip ◀
3	Skip ▶
7	Repeat
10	Play/pause
16	Numeric 1
17	Numeric 2
18	Numeric 3
19	Numeric 4
20	Numeric 5
21	Numeric 6
22	Numeric 7
23	Numeric 8
24	Numeric 9
25	Numeric 0
36	Level Up ▲
37	Level Down ▼
42	Memory/recall



Key number description and data code



Key No.	Function	Data Code	Key No.	Function	Data Code
0	Stop	000000	20	Numeric 5	001010
2	Skip ◀	010000	21	Numeric 6	101010
3	Skip ▶	110000	22	Numeric 7	011010
7	Repeat	111000	23	Numeric 8	111010
10	Play	010100	24	Numeric 9	000110
16	Numeric 1	000010	25	Numeric 0	100110
17	Numeric 2	100010	36	Level Up ▲	001001
18	Numeric 3	010010	37	Level Down ▼	101001
19	Numeric 4	110010	42	Memory/recall	010101

(This schematic diagram may be modified at any time with the development of new technology.)

* Caution!

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

- * Cover the parts boxes made of plastics with aluminum foil.
- * Ground the soldering iron.
- * Put a conductive mat on the work table.
- * Do not touch the legs of IC or LSI with the fingers directly.

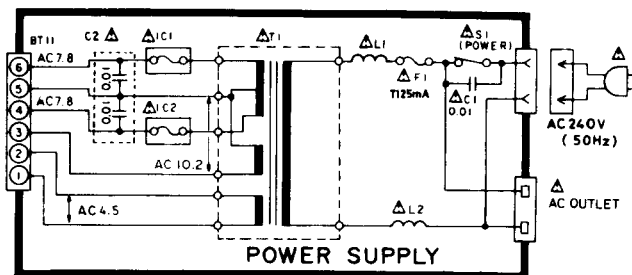
Notes:

1. **S1** : Power switch in "on" position.
2. **S2** : Voltage selector switch.
(For [XA], [XB], [PA], [PE] and [PC] areas)
3. **S101** : Disc holder open/close detection switch.
4. **S401** : Play/pause switch.
5. **S402** : Stop switch.
6. **S403** : Forward skip/search switch.
7. **S404** : Backward skip/search switch.
8. **S405** : Repeat switch.
9. **S406** : Recall switch.
10. **S407** : Clear switch.
11. **S408** : Memory switch.

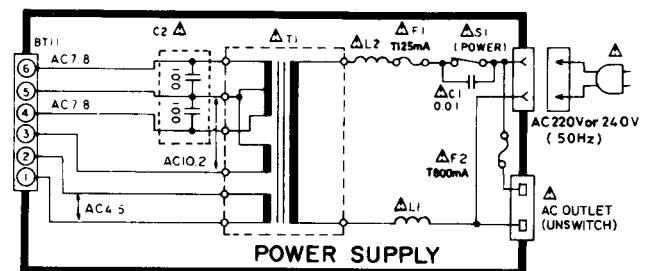
12. **S409** : Time mode select switch.
13. **S410** : Open/close switch.
14. **S411~420** : Numeric (0~9) switch.
15. **S421** : Edit (tape length) select switch.
16. **S422** : Tape side (A/B) select switch.
17. The voltage value and waveform are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
 - * The parenthesized are the values of voltage generated during playing (Test disc 1kHz, L+R, 0dB), others are voltage values in stop mode.
18. Important safety notice:
Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
19. ————— : Positive voltage lines and negative voltage lines.
————— : Audio signal lines.

• Power supply circuit

• For [EK] area

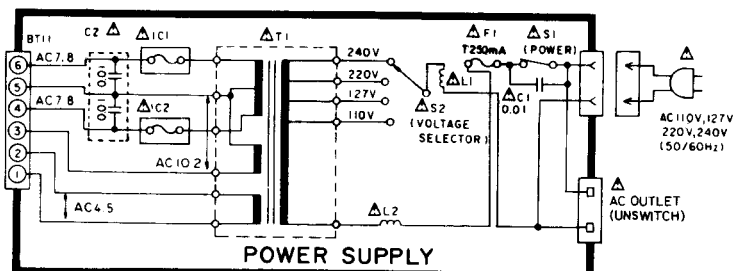


• For [E], [EG], [EB], [EH], [EF], [Ei] and [XL] areas

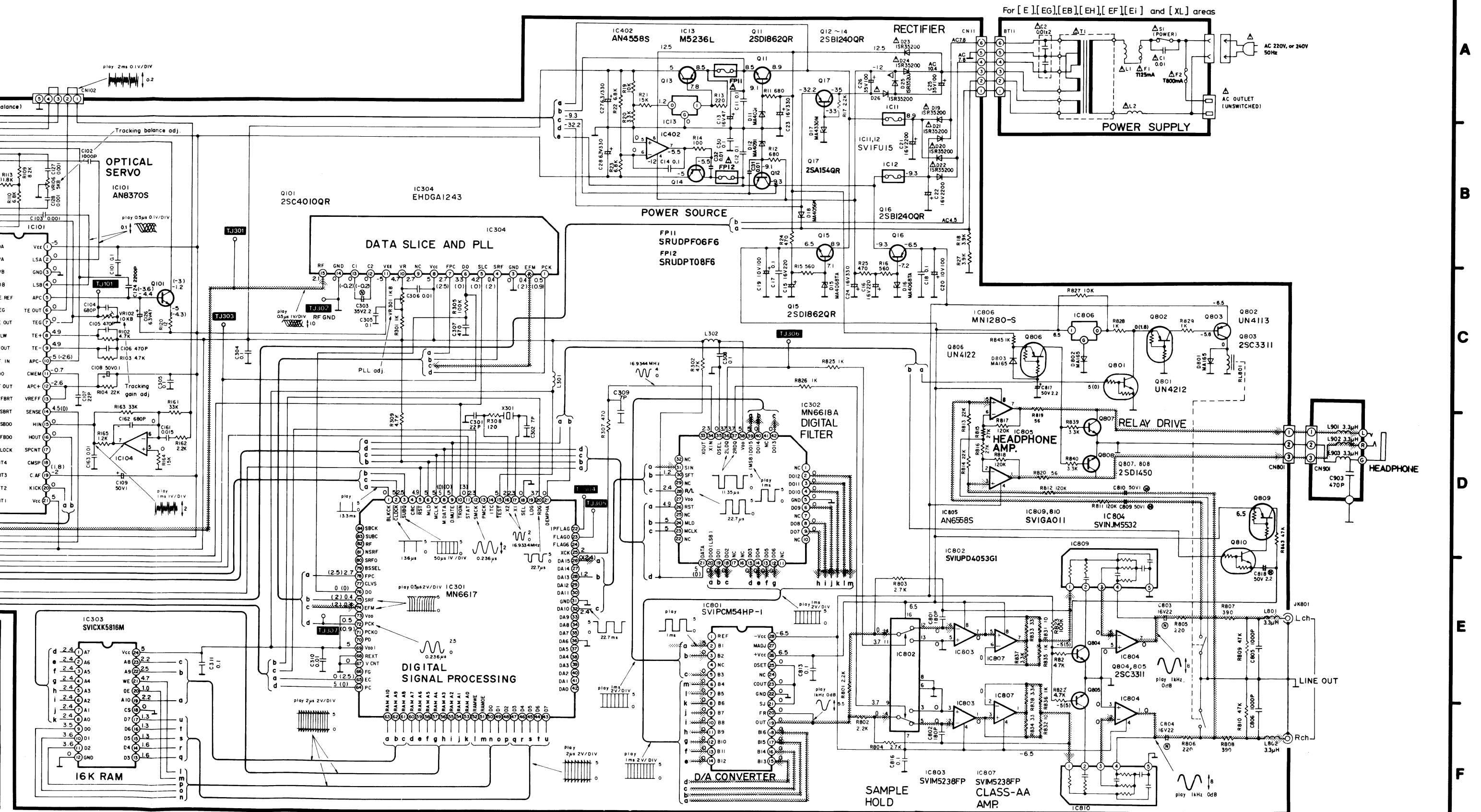


NOTE: For [XL] area the AC outlet and F2 are not provided.

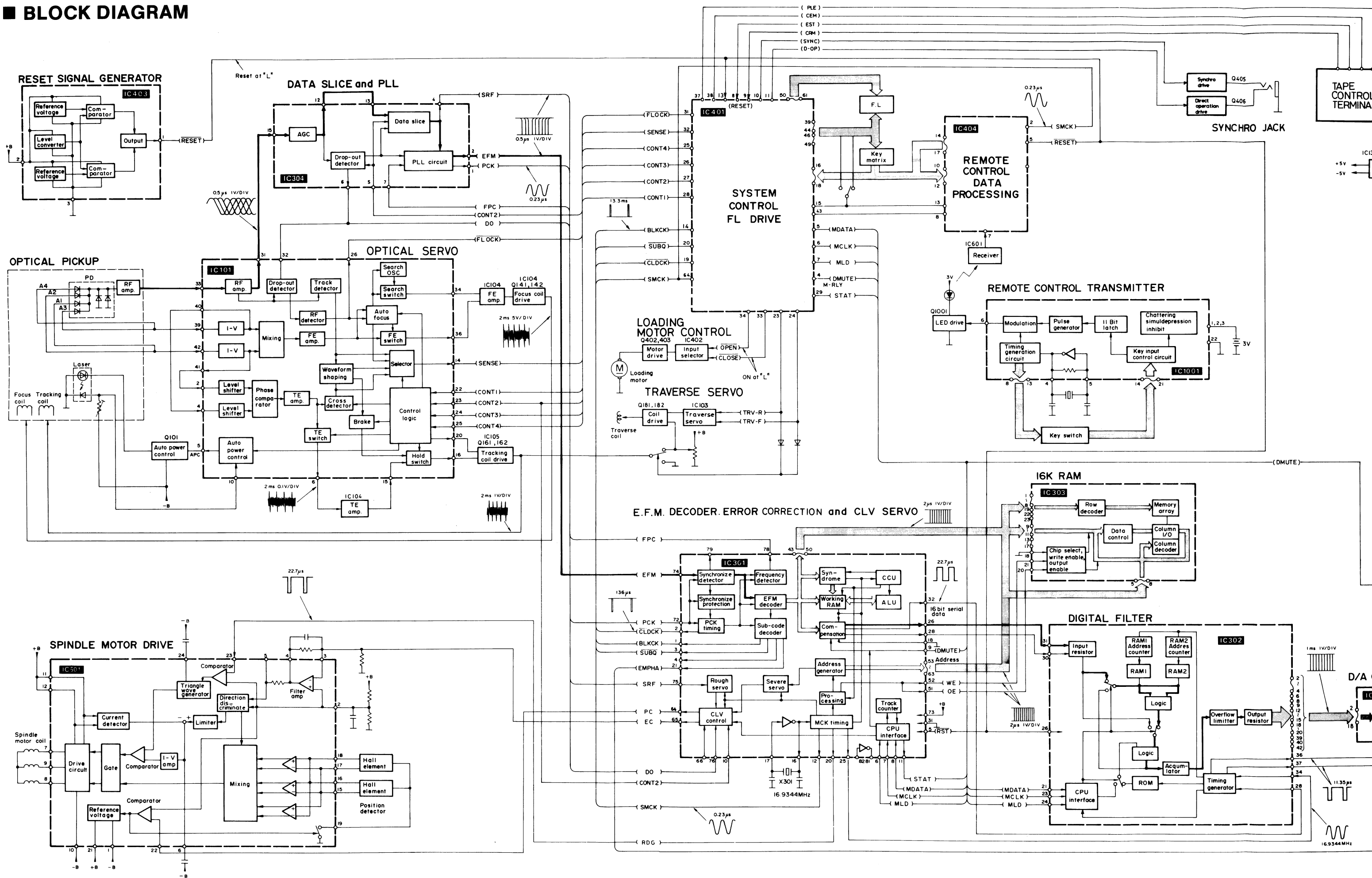
• For [XA], [XB], [PA], [PE] and [PC] areas



NOTE: For [XB] area the AC outlet is not provided.



■ BLOCK DIAGRAM





Service Manual

Supplement

COMPACT
disc
DIGITAL AUDIO

DIGITAL

Compact Disc Player
SL-PJ44

Color

(K) Black Type

Please file and use this supplement manual together with the service manual for Model No. SL-PJ44, Order No. HAD8703061C9.

Note:

- The class AA circuit of this unit has been changed to improve the distortion during production.
Please note the following points when servicing.

CHANGES

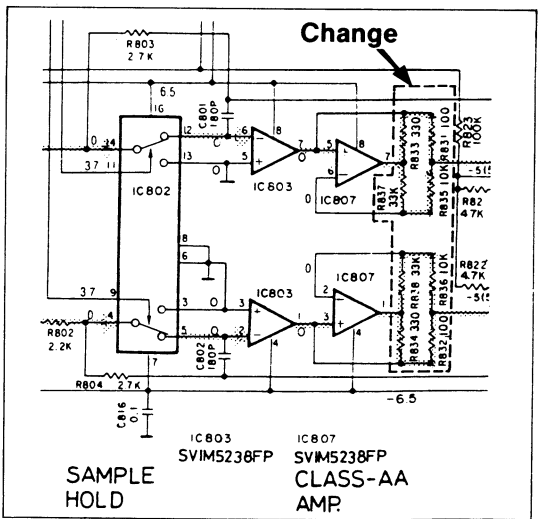
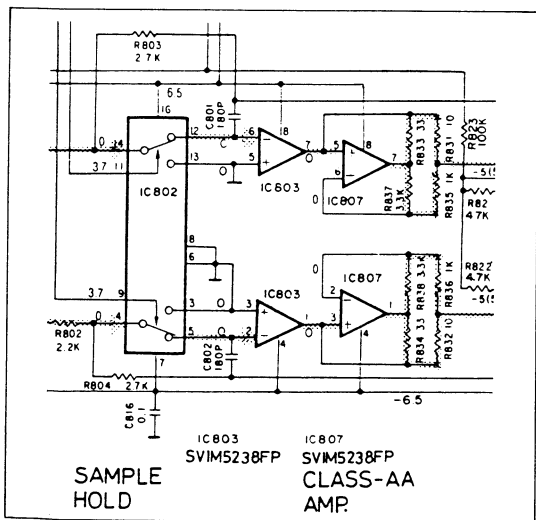
REPLACEMENT PARTS LIST

Ref. No.	Change of Part No.		Description	Remarks
	OLD	NEW		
RESISTORS				
R831, 832	ERDS2TJ100	ERDS2TJ101	Carbon, 1/4W, 100Ω, ±5%	Change
R833, 834	ERDS2TJ330	ERDS2TJ331	Carbon, 1/4W, 330Ω, ±5%	Change
R835, 836	ERDS2TJ102	ERDS2TJ103	Carbon, 1/4W, 10kΩ, ±5%	Change
R837, 838	ERDS2TJ332	ERDS2TJ333	Carbon, 1/4W, 33kΩ, ±5%	Change

Area

Color	Area
(K)	[E] Continental Europe.
(K)	[Ei] Italy.
(K)	[EG] ... F.R.Germany.
(K)	[EB] Belgium.
(K)	[EK] United Kingdom.
(K)	[EF] France.
(K)	[EH] Holland.
(K)	[XL] Australia.
(K)	[XA] Asia, Latin America, Middle Near East, Africa and Oceania.
(K)	[PA] Far East PX.
(K)	[PE] European Military.
(K)	[PC] European Audio Club.
(K)	[XB] Saudi Arabia.

SCHEMATIC DIAGRAM



Technics

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